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MONITORING TIMES

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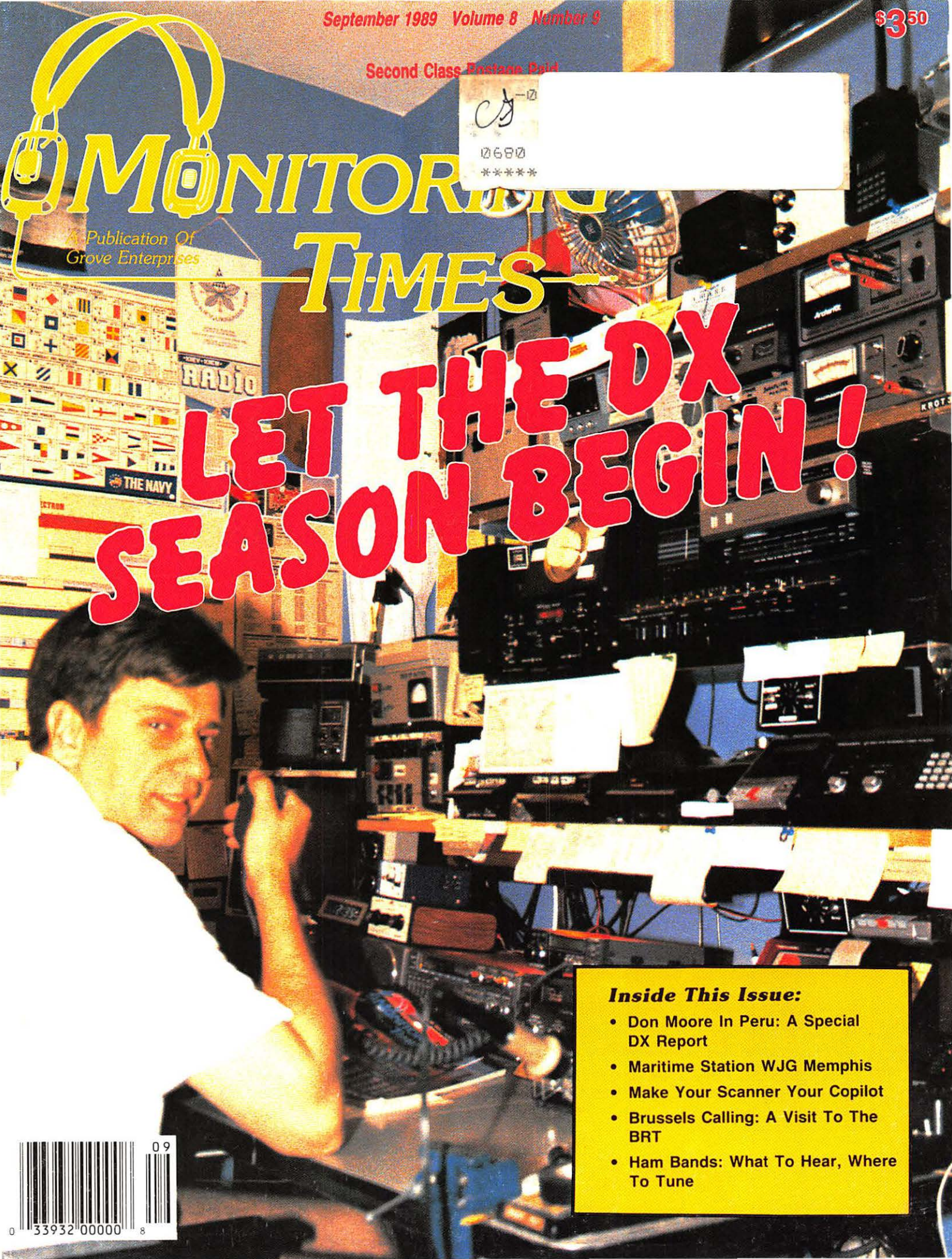

Inside This Issue:

- Don Moore In Peru: A Special DX Report
- Maritime Station WJG Memphis
- Make Your Scanner Your Copilot
- Brussels Calling: A Visit To The BRT
- Ham Bands: What To Hear, Where To Tune

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450 MHz	< 3 mv	< 5 mv	< 3 mv	< 1 mv	< 5 mv
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MONITORING TIMES

September 1989

WJG Memphis Calling *by J.T. Pogue* 6

Evolving from a small shack on a barge tied to the dock in Memphis to the best-known radio operation on the lower Misissippi, WJG meets the needs of the folks on the river. Functioning as a telephone system for the inland waterway, WJG has provided a vital -- sometimes the only -- link between water traffic and the shoreline.

DXing Peru *by Don Moore* 10

It's September and as the static begins to give way to the cleaner more tantalizing signals of fall and winter, *Monitoring Times* officially kicks off the DX season with a visit to Peru.

For surprise and mystery, nothing compares to shortwave radio in the land of the Incas. In the past decade alone, more than 100 new shortwave stations have started broadcasting from Peru. Many don't last very long, but there's been a never-ending parade of new ones to take their place. Nobody, not even the government, knows how many there are.

Sidebar on Celendin 13

Located in the front room of Gregorio Sanchez Aruajo's home in Celendin is his small electrical repair shop. And over in the corner is a small wooden box with three knobs sticking out of it. This is Radio Frecuencia 7.

Meet Senior Sanchez Aruajo as senior DXer Don Moore travels to this tiny station in search of Peru's smallest radio station.

Glenn Hauser on SW Broadcasting 24

Radio Frecuencia 7 is not alone. Stations just like it come from all four corners of the world. Their signals refuse to recognize borders, entering the thatched huts of small villages on Africa's Chubango River as easily as they do a brownstone in Philadelphia's Society Hill.

In this world, stations change dial position in an amazingly graceful but totally unchoreographed ballet of stations and nations. This is the world of shortwave broadcasting.

It takes extraordinary skill -- and dedication -- to keep on top of it all. But for the last several decades, one man has done just that: Glenn Hauser. This month, we introduce Glenn's expanded shortwave broadcasting report.

ON THE COVER: Mark Swarbrick is ready to DX!

Ham Bands Intro by Bob Grove 20

The Ham Bands are a place that more and more people are choosing to be. But even if you're not interested in the give-and-take of two-way communications, it can still be an exciting place to monitor.

MT publisher Bob Grove, who holds ham license WA4PYQ, offers an introduction to the ham bands with band-by-band commentary. It's the perfect guide to some exciting listening.

Urban Survival Tool by Mark Weigand 16

Nowadays, your scanner is more than entertainment. It can also be counted among the weapons in your urban survival arsenal. We're not talking "end of the world" stuff here. A scannner -- if mounted in your car or van -- can help you in more practical ways, like getting you to work faster.

Mark Weigand reports on mobile scanner applications in his first *Monitoring Times* report, "Make Your Scanner Your Copilot." Warning: in some jurisdictions, having a scanner in your vehicle can be illegal.

BRT Visit 22

When one shortwave listening *MT* reader found himself in Belgium, it was only natural for him to want to visit his favorite station, the BRT. Initially unsure if he'd even be allowed into the station, he was surprised to find a very warm reception. To his surprise, he even got on the air!

Others have told stories about being treated like plague-infected rats when they visit a shortwave station. But Philadelphia's Andy Ross tells a very different story, the story of his visit to Belgische Radio en Televisie.

And More ...

Leonard Kahn outlines some of his inventions and innovations which could help revive the public's interest in AM broadcast stations -- if given the right to compete fairly -- in the "American Bandscan" column. It's amazing how many defunct pirate stations have been showing up lately, one way or another -- You'll find those in "Outer Limits." And low frequencies have their mysteries, too. Joe Woodlock recalls his own experience following the tangled history of Swan Island -- or is that Islas del Cisne? -- in "Below 500 kHz."

DEPARTMENTS

MONITORING TIMES

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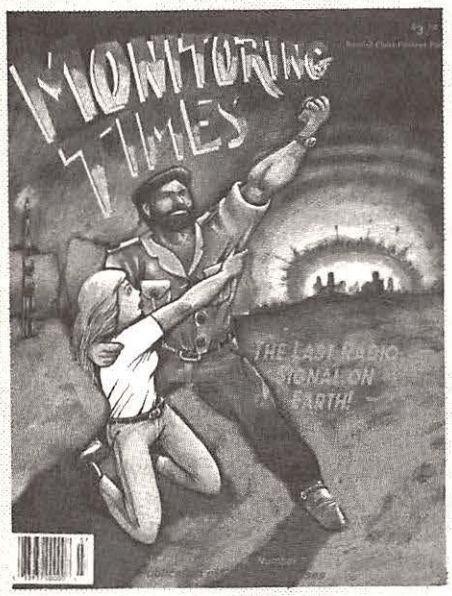
LETTERS



Boom! Nuclear weapons weren't the only thing exploding at the end of Wayne Mischler's fictional piece, "The Last Radio Signal on Earth!" (July, 1989, Monitoring Times). Some of our readers did, too. Some letters detonated in our mailbox. Some of the fallout is below.

R. Steck of Illinois said that "The last thing I want to see in *Monitoring Times* is fiction." Guy Knight, also of Illinois, agreed, adding that "If I want to read that sort of thing I'll buy a paperback."

G.S. Richardson of Richmond, Virginia called the use of fiction in the magazine "A poorly planned and executed departure from what is otherwise a fine and useful publication."

"You have always been so clearly ahead of your competition. Why would you want to go and shoot yourself in the foot?" asked Ron Atkins of Long Beach, California.

R.D. Ekstedt of Evanston, Illinois, said the the cover made the magazine look like a "damned kids comic book" adding that "I have been embarassed to leave it lying around for fear my friends may think I have gone over the edge" and David G. MacDonald of Chicago Heights, Illinois, took his protest one step further: "Please remove my name from your mailing list."

Lou Burkhardt made a simple plea, "Please, no fiction" and then added a stinger saying that he "liked *Monitoring Times* better when it was mimeographed."

But perhaps the strongest comment was by Richard Chabot of Organ, New Mexico. "I don't know what brought on the 'comic book' cover and the related story but whatever it was I hope that it is over. Did you lose a bet? Lose your mind? Or just regress to the third grade? Please. No more of this trash."

Longtime *Monitoring Times* readers know that the magazine grew because it had the courage to experiment. In fact, it is this very willingness to experiment that has made us the uncontested leader in radio-related publications. From the slickest to the sleaziest, they've all borrowed in one way or another from *MT*.

Still, the question of fiction is open to debate. After all, ham radio has its long-running and good-selling series of ham fiction books. Why not shortwave and scanning? Comments? Let's hear from some readers that enjoyed "The Last Radio Signal on Earth." We did. We wouldn't have run it had we thought for a moment that you would not.

David Huston of Gaylord, Michigan, writes to say that "I have lost touch with an old friend and fellow broadcaster, Jeff White. Any idea of his present address?"

White, who was host of the popular Radio Earth show earlier this decade, is now a roving reporter. Try writing to him care of the Dolphin Beach Resort Hotel, 4900 Gulf Blvd., St. Petersburg Beach, Florida 33706. Ask them if they will forward your letter.

Back in the July issue we said that we hadn't seen a copy of the A*C*E bulletin since they suspended publication some time ago. A*C*E specialized in providing news about pirate and clandestine activity.

Now Kirk Baxter, President of that club, writes with good news: "A*C*E is still very much in existence, publishing a bulletin monthly since 1982."

Apparently, reports of the club's demise are greatly exaggerated. As is often the case with all-volunteer organizations like A*C*E, there have been a few rough spots. But, says Baxter, "There have only been a few cases where the bulletin has been combined into an expanded edition to cover two or more months during times when one of our publishers experienced problems."

Some confusion may have also arisen out of the fact that the club has changed addresses. "Over the past three years," Kirk continues, "we have had mail handled from offices in Wilmington, Delware, and Baton Rouge, Louisiana. Both these centers are now closed."

Clubs: *Monitoring Times* has been a long-time club supporter. But you must keep us informed when changes occur. Further, it's good financial sense to put *MT* on your bulletin and P.R. mailing list. Even if you get only one plug a year, when compared to the price of advertising space in this magazine or any other, you still come out *'way* on top.

So let us know what's happening *with your club. Write to Monitoring Times* editor Larry Miller (P.O. Box 98, Brasstown, NC 28902). Again, make sure *MT* is on your mailing list. We can't publicize you if you don't let us know what's going on.

As for A*C*E, although we still haven't seen a copy of the bulletin, we are aware of Kirk Baxter's reputation and on that alone we can recommend that you investigate a subscription to this club.

Samples are $1.50. A one year subscription is $16.00. The current address: P.O. Box 11201, Shawnee Mission, Kansas 66207. Thanks also to George Zeller for his comments.

"The Christian Thought Police have struck again," says David R. Husted of Minneapolis, Minnesota.

[Continued on page 100]

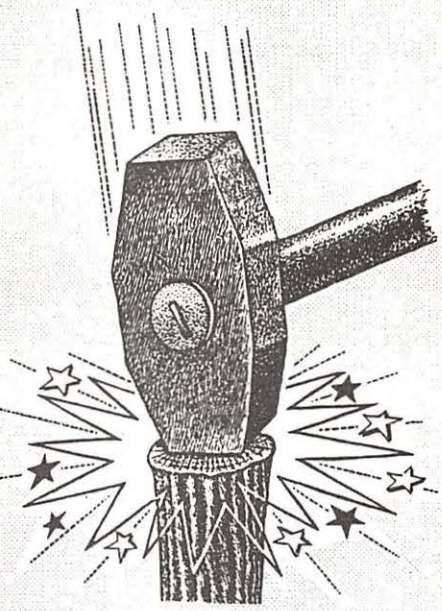
COMMUNICATIONS

Say it isn't so!

Experts now warn that electromagnetic fields from common electrical power systems may pose a health hazard. They conclude that electromagnetic fields interact with the membranes that envelope every living cell.

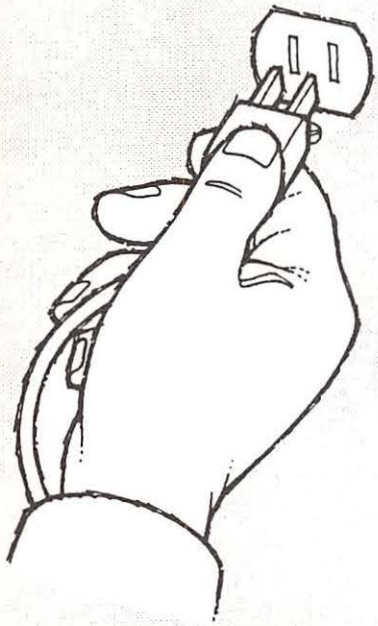
Analysts at the Congressional Office of Technology Assessment now believe that even weak electric and magnetic fields -- created whenever electricity flows -- may effect human health.

Says study author Dr. Granger Morgan of Carnegie-Mellon University, "...if I were a pregnant woman, I'd stop sleeping under an electric blanket."



The FCC Hammers Jade

The hammer of FCC enforcement came down on Jade electronics in Trevose, Pennsylvania. Confiscated were over $30,000 worth of illegal CB transceivers and linear amplifiers manufactured in the Far East and imported into the United States. The operators of Jade Electronics face a $200,000 fine and one year in prison.



Too much of a good thing?!

FCC Hammers Pirate

Two Massapequa, New York, ham radio operators have been ordered to pay a $750 fine for operating a pirate radio station. FCC engineers monitored WNPR playing popular music on 7415 kHz. Herbert Meyers, K2LPK, and Neal Newman, KA2CAF, were both charged although Meyers, reached by telephone, denied any wrongdoing.

"I wasn't even home," said the 60 year old Meyers. "I've never paid a fine. I'll never pay a fine." Meyers claims that Newman entered his house without permission. Newman could not be reached for comment.

KENWOOD

New Radio Bulletin Board

Kenwood Communications has announced that their firm is now accessible via computer. The Kenwood BBS is now operating on a trial basis between 5:00 pm and 8:00 am (Pacific Time) Monday through Friday and 24 hours a day on Saturdays, Sundays and holidays. System parameters are (up to) 2400 baud, 8 bits, 1 stop bit, no parity. The number is 213-761-8284.

Long Distance Reception

Local papers were abuzz with the news that Washington DC radio station WRC-AM got a reception report from Finland. One article began, "Anyone who has ever had trouble tuning in a local radio station will get a kick out of this. WRC-AM (980) recently received a letter from a man in Finland who was able to receive the station for about seven minutes..."

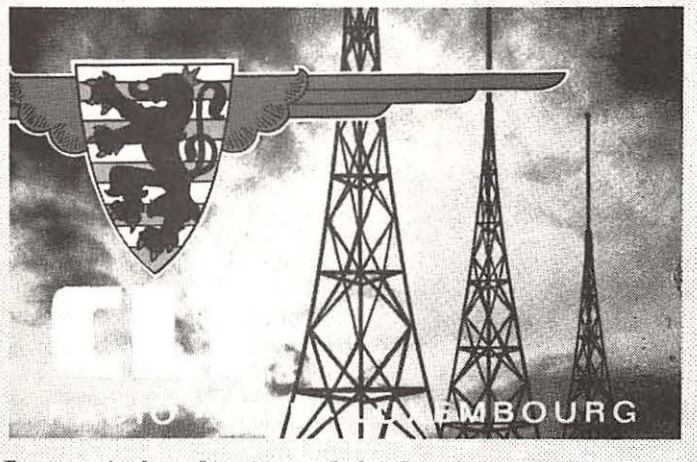
Finn Hannu Tikkanen, who lives in Helsinki, told the station that he heard them during a "listening trip" to Lapland. The *Times* article explained it in Mr. Tikkanen's own words: "That's why I go up there every winter. To spend some two weeks in an isolated cottage listening to my [radio] only, during the coldest time of the year in 24-hour darkness."

Makes it sound so attractive, no?

Palomar Wins

A four-way trademark infringement lawsuit between Palomar Engineers, RF Limited, RF Parts Co., and

COMMUNICATIONS



Partners in broadcasting -- Ireland and Luxembourg?!

Westcom has been concluded.

According to *W5YI Report*, Palomar Engineers was confirmed as the owner of the Federal Trademark registration for the name Palomar in the radio equipment field.

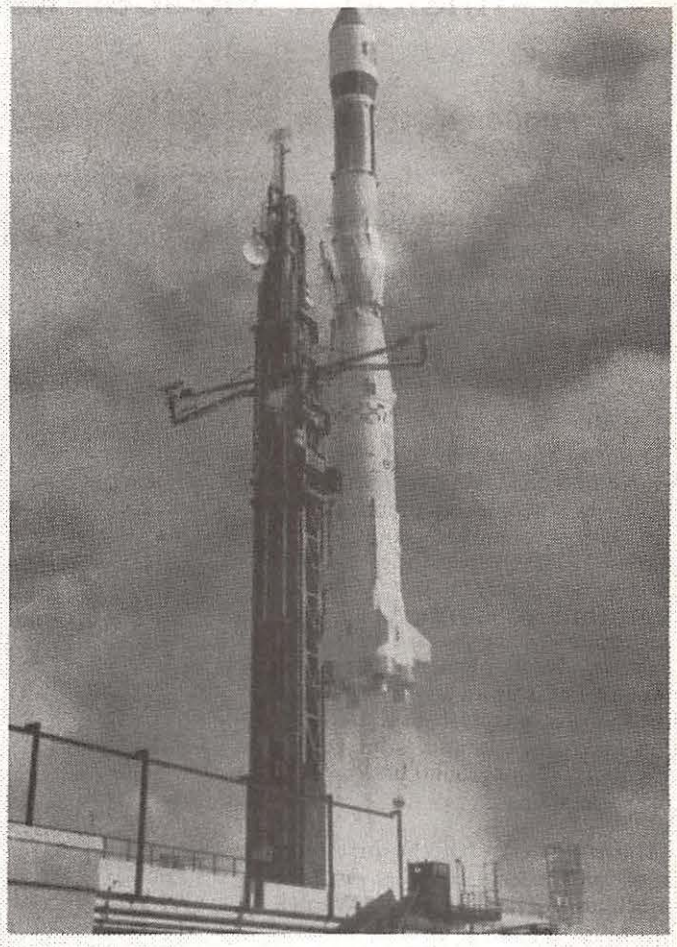
New Longwave Target

Radio Tara, the joint station to be launched by Ireland's RTE and Radio Luxembourg, has a new name: Atlantic 252. The new station, to broadcast on 252 kHz (longwave), is due to be on the air by the first of this month with a powerful 600 kHz transmitter.

The British government doesn't like the idea of Atlantic 252 and has protested to the Irish government. They feel that commercial broadcasters in Britain will lose audience and advertising to the new station.

Up, Up, and Away

Arianespace officials now say that MICROSAT's launch is set for November 9, 1989. This year will be a banner year with six, perhaps seven, amateur radio satellites lifted into orbit. A Japanese amateur radio satellite, JAS-2, is scheduled for January 23, 1990.



Ariane's rocket gives a new boost to satellite communications

Wheel of Fortune

Police in Naples, Italy, have shut down two small private television stations on suspicion they may have been transmitting coded messages to the Mafia.

According to viewers, nightly game shows were often interrupted by messages such as "beware of the white shoes" and "the boats have arrived."

Found, the Lost Peninsula

On Sept 9 and 10, elements of the Oliver Hazard Perry Expeditionary Force will raid Michigan. Transmitting from a newly discovered peninsula not even attached to the state, WD8LKI will commence operations on Sept. 9 at 1300 UTC.

Suggested frequencies are 28.365, 21.365, 14.265, 7.265 and 3.965 MHz.

To find the Lost Peninsula, send your QSL and an SASE to Como Wills, 30372 Bates Rd, Perrysburg, OH 43551. SWL reports will be acknowledged.

Lt. Arnal Cook, FPO Seattle, WA; Patrick Glick, Oxon Hill, Maryland; Ed Hesse, North Merrick, NY; Radio Sweden; W5YI

WJG Memphis Calling --

Inside a Pioneer Mississippi River Station

by J.T. Pogue

From the highway, the only clue the station gives you are the letters "WJG" on a big silver mailbox. But a short drive up a tree-lined lane will lead the curious to a modest white two-story building that is the home of the best known radio operation on the lower Mississippi River.

Dwarfed by a canopy of a huge log-periodic antenna, WJG is a vital link between the people on the river and their bosses, families, and others ashore.

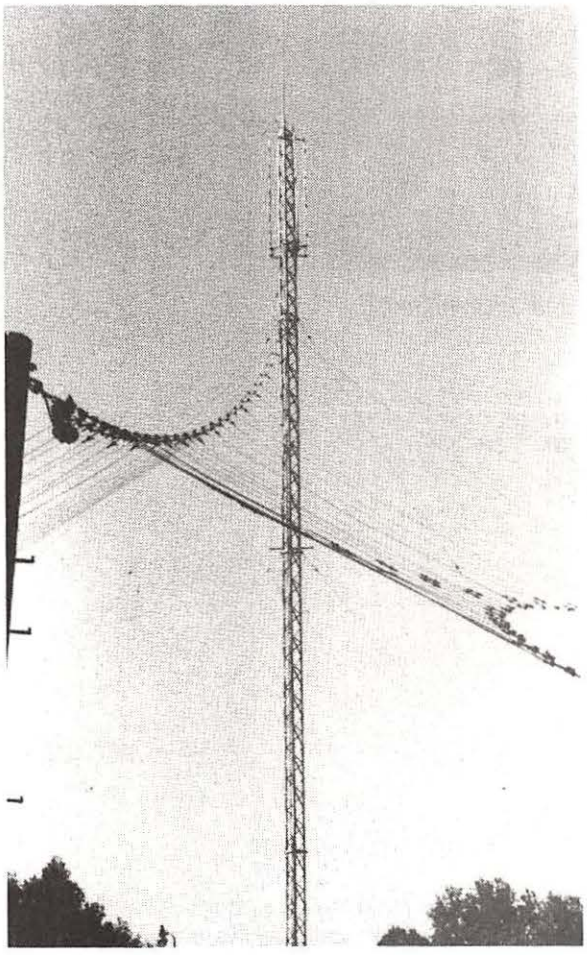
Over Half A Century

Today, WJG regularly completes thousands of ship-to-shore telephone calls; so many in fact, that the station is often taken for granted. But getting the station off the ground back in 1936 took some doing.

The idea for WJG, the first radio station on the inland rivers, was the brainchild of one Russell V. Warner. Known by the men on the river as "Skipper," Warner began his career in 1908 as a 15-year-old coal passer.

By 1913, he had earned his first river pilot's license. Ten years later he brought the first commercial towboat through the then newly-opened Lakes-to-Gulf Waterway into Chicago. Later, he piloted the first diesel tow-boat, the Mary Elizabeth, on the lower Mississippi River.

Prior to 1936, towboats on the inland rivers had no way to communicate with those ashore. If the boats needed provisions or assistance in an emergency, they had no recourse but to keep on steaming until they reached the next town or settlement. Warner realized that installation of radios aboard the towboats and ashore could potentially save money and lives.



In a 1977 interview, Warner said, "I remember that the government didn't want to give us a license for two-way radios. They said there was no need for it. But other fellows," he continued, "didn't think so, and so we got Old Man McKellar (Senator Kenneth McKellar, the dean of the U.S. Senate at the time) to pull a few strings and that helped change a few minds. Once we got the go-ahead, radios went like wildfire."

Warner continued to run WJG as well as a thriving towboat business until his retirement in the 1960s. The succeeding years have seen a variety of technical changes and improvements as WJG continues to serve the needs of the people on the river.

Operating Equipment

Originally, WJG was strictly an AM operation on the HF (high frequency or shortwave) bands. The first station was actually located in a small shack on a barge tied off at the Memphis city front.

Later, WJG moved to a small antenna-festooned building in a pear orchard on the outskirts of the city. The station now sits in a semi-rural area just south of Memphis.

With the demise of AM, new SSB equipment was installed to replace the old gear. A network of VHF-FM marine band sites was begun in the 1960s, and now includes 14 locations. There are plans to expand this to a total of 18 sites in the near future.

Coverage of the VHF-FM network alone includes the Mississippi River from roughly 30 miles north of Cairo, Illinois, to 50 miles

The unimposing home of WJG, underneath its log periodic antenna.

below Baton Rouge, Louisiana. Sites on the Arkansas also cover approximately 180 miles of that river.

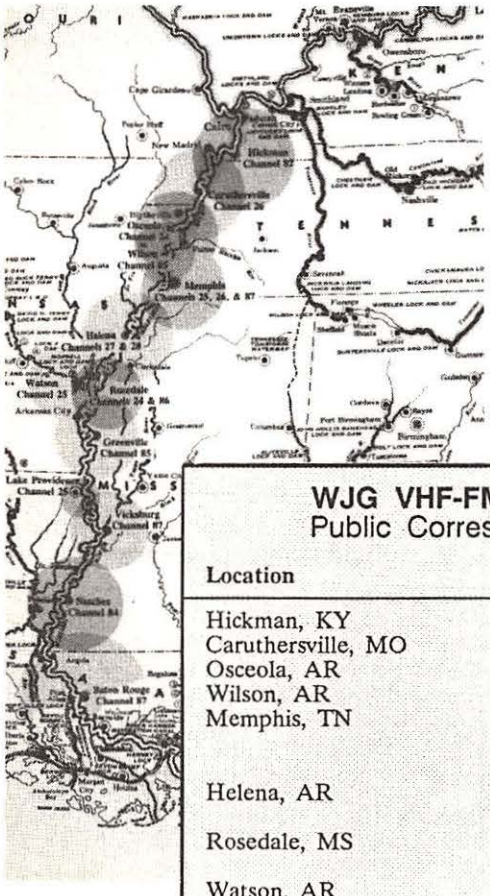
The SSB station at WJG uses a CAI transceiver running 1,000 watts into a stationary wire log-periodic antenna. The antenna is oriented primarily north and south for optimum coverage of the Mississippi River, but as you'll see when you try to tune it in, WJG is frequently heard well from coast to coast.

The VHF-FM stations used by WJG are a combination of General Electric and Motorola transceivers connected to Memphis by leased telephone lines. The transmitters run about 50-watts each, and the sites use a combination of four-element directional and omni-directional antennas to provide nearly 100 percent coverage of the river.

Two operators are on duty at WJG during daylight hours to answer calls from America's inland rivers.

Not just another phone company

In the 1950s, before the Coast Guard had their extensive communications system in place, a call to WJG was often the only way towboaters could call for help. In one incident, two such craft were involved in a collision. Two of the towboats guiding Joseph Chotin's barges exploded, transforming the river into a furnace. Operators at WJG sent fireboats and land-based equipment to the rescue, and as a result, damage was minimal.



On another occasion -- Christmas Day, 1952 -- DXers listening to WJG could have heard yet another tense drama unfold. In the Gulf of Mexico a ship was foundering in a gale. When the operator at WJG asked the crew if they could do anything for them, they grimly jested, "You can make these seas calm down."

WJG operator Jerry DeGregory replied, "I can't do that, skipper, but I know someone who can."

Back through the wild night came the tired voice, "Okay, Jerry. Speak a word to Him, will you?"

Later that night, the skipper of the ship came back on the air to report, "Okay, Jerry, thanks. I'm all right now."

Over the years, WJG has been called upon to provide an unusual variety of communications services. In the 1970s, a mining expedition contracted with the station to provide them a means to contact their home office from a remote location in the mountains of Colorado. In the days before satellite communications were common, WJG was the expedition's only link with the outside world for over six months.

The mammoth overnight delivery service Federal Express has its global headquarters in Memphis. A unique provision in WJG's license also allows it to communicate with aircraft. Operators are sometimes called by FedEx planes with requests to hook them up for phone calls with the home office.

The Heart of the Station

Walking into the operator's room at WJG can be a staggering, not to mention deafening, experience. Surrounding the

WJG VHF-FM Radio Site Information
Public Correspondence Channels Used

Location	Channel	Shore XMT	Ship XMT
Hickman, KY	87	161.975	157.375
Caruthersville, MO	26	161.900	157.300
Osceola, AR	24	161.800	157.200
Wilson, AR	85	161.875	157.275
Memphis, TN	25	161.850	157.250
	26	161.900	157.300
	87	161.975	157.375
Helena, AR	27	161.950	157.350
	28	162.000	157.400
Rosedale, MS	24	161.800	157.200
	86	161.925	157.325
Watson, AR	25	161.850	157.250
Greenville, MS	85	161.875	157.275
Lake Providence, LA	25	161.850	157.250
Vicksburg, MS	87	161.975	157.375
Natchez, MS	84	161.825	157.225
Baton Rouge, LA	87	161.975	157.375

A technician repairs a VHF-FM module for a remote control site.

modest-sized room on the second floor of the station, no less than 16 speakers blast a nonstop cacophony of sounds from up and down the river.

Two operators sit before a Christmas tree-like control panel of flashing red, yellow, green, and white colored lights. Routinely, they complete over 8,000 ship-to-shore telephone calls a month. During the winter months, this total goes up even higher as mariners rush to get their cargoes and boats out of the upper Mississippi and Illinois rivers before they are frozen in.

Next to the console, a special handset for the SSB equipment on the first floor sits next to its SELCAL gear. Most telephone calls are handled on the VHF-FM circuits, while SSB is used primarily for passing telex messages and other information between towboats and their owners.

A small PC on wheels just behind the operators keeps track of the locations of towboats, and compiles information on cargoes, barge transfers, etc. This information is then passed on to the towboat and barge owners.

Just outside in the next room, an old National Weather Service teletype clickety-clacks with information on river stages and other meteorological information of interest to the rivermen.

Into the Future

The man who runs operations at WJG is station manager Stan Smith. Looking into the future, he recently said, "I believe one day everyone will have their own pocket phone. Although SATCOM (satellite communications) have been tried on the river, they just haven't proved cost effective.

"We have an application in with the FCC for a fully automatic system, but it hasn't been approved yet. As long as we can continue to give good manual service with customer satisfaction," he concluded, "we will be satisfied."

Hearing WJG At Your Monitoring Post

The people at WJG have apparently always realized that DXers were out there. In an article published nearly 35 years ago in the now defunct *American* magazine, author Don Eddy stated, "Rivermen have no secrets ... for there is no privacy on the radiophone; anyone with a shortwave receiver can listen in, and everyone does."

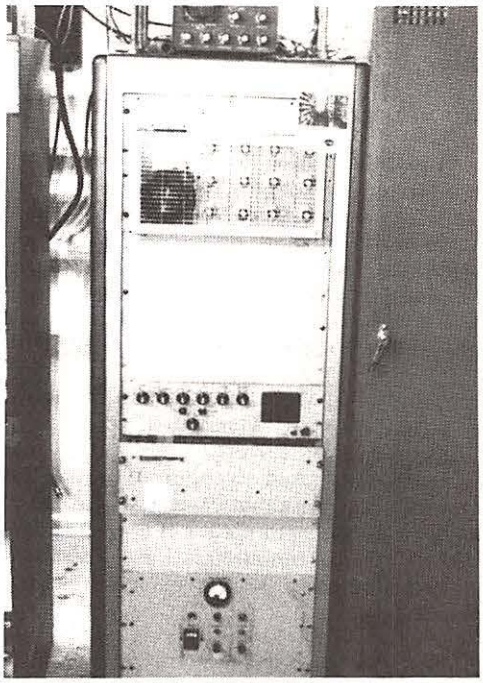
For many listeners, the SSB station will be your easiest way to hear WJG. Although authorized to operate on frequencies in the 2, 4, 6, 8, 12, and 16 MHz bands, experience has shown that 4 MHz is the band favored by most customers. Therefore, this is the only HF band that WJG currently operates on.

Their one kilowatt signal can be heard on 4087.8 kHz upper sideband. All contacts are simplex, meaning that both WJG and the ship are operating on the same frequency. The best time to hear them is from 0830 through 1230 UTC or after when daylight begins to dissipate signals on the lower frequencies.

Station Manager Smith keeps a file of letters he receives from DXers. Monitoring posts in California, Virginia, and New Hampshire have checked in, reporting generally good reception of WJG's signal. The station QSLs all correct reports with either an attractive QSL card or a personal letter.

If you are fortunate enough to live along the lower Mississippi or Arkansas rivers, you will likely be able to hear WJG on one or more of their VHF-FM sites. The table below lists all site locations along with the public correspondence channels used by that site.

All calls on the public correspondence channels are duplex, with WJG operating on one frequency, and the ship operating on another. This way the connection operates like an actual telephone call.



The high frequency transmitter used on the 4 MHz band by WJG-Memphis

At the conlusion of this article is listed information on other waterways operators in Cincinnati, St. Louis, and Jeffersonville, Indiana. Although countless other smaller operators are on the VHF-FM band, only WJG and the other three listed are on the HF bands.

WJG now moves into their second half century, continuing to provide vital services to the men and women of the river. Why not listen for this unique station with a fascinating history?

mt

Other Major Radio Operators on Inland Rivers

Station and Mailing Address	HF Freqs kHz
WFN Jeffersonville Radio c/o American Commercial Barge Lines P.O. Box 610 Jeffersonville, IN 47130	4115.7 6518.8
WGK St. Louis Radio P.O. Box 55, Mitchell Branch Granite City, IL 62040	4410.1 6212.4
WCM Cincinnati Radio c/o Ohio River Company 1400-580 Walnut St. P.O. Box 1460 Cincinnati, OH 45201	4063 6515.7 8213.6

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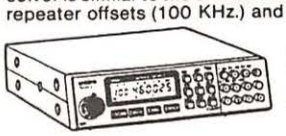

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PERU: DXing the Land of the Incas

by Don Moore

Don Moore

For surprise and mystery -- new stations, frequencies varying across the dial, stations coming and going unpredictably -- nothing compares to shortwave radio in Latin America. Yet, in the turbulent Latin American broadcasting scene, never have so many changes happened so often as in Peru in the 1980s.

In the past decade, more than 100 new shortwave stations have started broadcasting from Peru. Many don't last very long, but there's been a never-ending parade of new ones to take their place.

Unpredictability is just one of many reasons that DXers find Peru, land of the ancient Inca Indians, one of the world's most fascinating DX countries.

Land of the Incas: Starting in 2000 B.C., Indian civilization periodically rose and fell in Peru, each building on the knowledge of its predecessors. The greatest of them all, the Inca Indians of southern Peru's Cuzco valley, began their march to civilization with military conquest. By 1450 they controlled western South America, from present day southern Colombia to central Chile.

Their empire was linked by a road network better than any in Europe at that time. On terraced Andean mountainsides, they grew potatoes and grains especially suited for the harsh mountain climate. A system of government storehouses kept several years supply of food so that even in the worst of times, no one went hungry.

At the height of its glory, the Inca Empire fell in one quick swoop. In 1532 a Spanish adventurer, Francisco Pizarro, and a small band of soldiers landed on the coast. At Cajamarca, the Spanish used treachery to ambush and capture the Inca emperor, Atahualpa. Atahualpa was promised his freedom if his vassals filled a room with gold.

They did, but Pizarro broke his end of the deal, murdered the Inca ruler, and marched south to Cuzco to complete the conquest of the now leaderless empire.

The Incas never totally accepted their defeat. Remnants of the civilization hung on in the mountains north of Cuzco until 1572. Reduced to near slavery, the Incas periodically revolted as late as 1814.

In 1780, they nearly succeeded in retaking their country from the Spanish. However, when independence from Spain was finally obtained in the 1820s, it was the Peruvian-born Spanish elite, not the Indians, who controlled the country.

Peru Today: Although smaller than the Inca empire, modern-day Peru is a large nation -- over a half million square miles in area. The population is sparse -- twenty million. Around eighty percent are descended from the Incas.

Many live much as they did five hundred years ago, except for a few modern conveniences such as battery radios and plastic water jugs. The Inca language, Quechua, is their mother tongue. Nearly two million don't speak Spanish, especially in the central and southern parts of Peru's Andean region.

Geographically, Peru is a land of extremes. More than 40 percent of the population live in the "costa," a narrow band of coastal desert, broken by lush irrigated oases. Here are found the major cities, such as Lima, Trujillo, and Chiclayo, and most of the country's paved highways.

Dissecting the country, north to south, is the "sierra," the backbone of the Andes Mountains, reaching as much as 24,000 feet in height. Half of Peru's population lives in the mountain valleys and plateaus, and sometimes on the mountains themselves, once the heart of Inca empire.

From the smallest villages to the important cities of Cajamarca, Huancayo, Ayacucho, and Cuzco, most of the towns were originally Inca settlements. With the exception of a few railroads in the south, this rugged area is mainly reached by rough dirt roads, frequently little more than paths.

East of the Andes is the "selva," the Amazon jungle. Although it covers almost two thirds of the country's area, only five percent of the population lives there. The only city here is Iquitos, Peru's "Atlantic port." The city lies two thousand miles from the Atlantic Ocean, but the Amazon is deep enough that ocean-goinng vessels can dock in Iquitos.

The Peruvian government believes the country's future lies in exploiting the natural resources of the selva. Development has already begun, with the discovery of oil fields ranging from the Ecuadorian border to as far south as Pucallpa.

Shortwave Radio in Peru: Because of the country's varied geography, shortwave radio has played a major role in the development of communications in Peru. As in most of Latin America, when commercial radio first began in Peru in the 1920s and 1930s, there were just a few stations in main cities, trying to reach a national, or at least regional, audience. They couldn't easily do this on AM, especially with the lower powered AM transmitters of the day, so shortwave was added. As a cheap and cost effective way to broadcast to a large area, shortwave couldn't be beat.

Up until the 1950s, most Peruvian shortwave stations were in the larger cities. However, beginning in the 1950s, and continuing into the 1960s, several dozen shortwave stations were founded in the departmental (state) capitals and other principle towns of the Andean highlands.

Listeners preferred tuning in these local stations. Because audiences in the far flung areas declined, some big city stations began to shut down their shortwave transmitters, but shortwave radio in Peru was by no means dying. Instead, a new era was about to begin.

By the 1970s, stations began to pop up in the smaller towns, especially in northern Peru. Located in remote Andean valleys and the river towns of the Amazon jungle, the new stations have found shortwave to be indispensible.

First, stations need shortwave to reach many rural mountain villages and jungle settlements. Secondly, without a telephone system in rural Peru, and extremely slow postal service, shortwave fills the communications gap.

Commercial shortwave radio is the principle method of communication between provincial towns of the Andes and Amazon jungle. The government uses it. Businesses use it. Listeners contact distant family members and friends. Paid personal messages, called "comunicados" or "servicios sociales" are broadcast to reach distant areas.

It took time to get radio into these remote areas. The northern department (state) of Cajamarca is a good example. Cajamarca was an important region under the Incas, and today is the agricultural breadbasket of northern Peru. Yet, as late as 1978, the only radio stations in the department were in the

capital city of Cajamarca, and Jaen, the main town of northern Cajamarca.

Other departmental towns were thought to lack a big enough local market to support a radio station. Additionally, with no electrical service, or perhaps only a few hours nightly via a weak municipal generator, there was no available power supply.

However, in 1978, a group of Chota's citizens (a provincial, or county, capital north of Cajamarca) realized they could put a station on the air if they bought their own generator. To get a station underway, they hired an experienced engineer, Mauro Vasquez Gonzales, from Trujillo.

Mauro set up a diesel generator, transmitter, and antenna on the outskirts of Chota. The downtown studio was powered by car batteries, charged at the generator site. To the surprise of many, the station made money.

Radio Chota proved that local radio stations were feasible. Since then, at least fifty different shortwave stations have been on the air at one time or another from Cajamarca department. Unlike Radio Chota, many of these have not been successes, lasting only a few weeks or a few months, before being closed down by economic reality.

Still, one or two have made it in each town, and there is always a potential station owner willing to gamble on a new station. With the possible exception of Peru's jungle department of San Martin, probably no other similarly sized area of the world has seen so much shortwave activity in such a short period of time.

DXing Peru: Nobody, including the Peruvian government, knows how many shortwave stations are on the air in Peru at any time. Around a hundred would be a good guess, however.

A few stations remain in coastal cities, especially Lima, but not many. Most older stations remaining on shortwave are in principle towns and departmental capitals of the Andes including stations such as Ondas del Huallaga, Radio Andiana, Radio Huancavelica, and Ondas del Titicaca.

Many of these long-established stations broadcast in the 60 meter band, although a few can be found in 90, 49, and even the 31 meter bands. For the most part, they use medium powered transmitters, usually at least five kilowatts.

In general, these are the easiest Peruvian stations to hear, although "easy" is relative. They are not as easy to hear as similarly powered stations in Central America, Venezuela, or Colombia. Also, as is frequently the case in Latin America, the stations might go off the air for months or years at a time, before suddenly reappearing. By any standards, these are real DX challenges.

New small town broadcasters provide an even greater challenge. Few use more than a kilowatt; many use less than half that. To the DXer's advantage, however, most use frequencies outside the nominal shortwave broadcasting bands, especially in the 4200-4500 kHz and 6250-6950 kHz areas.

Don Moore

Radio Ancash uses 10 kW on 4990 kHz and is well heard in North America.

Because the licensing process takes at least two years in Peru, many stations come on the air first, and then worry about becoming legal. So, they take whichever frequency they feel like, or, more likely, whichever one they happen to have a crystal for. Occasionally, a station even pops up in the 80 or 40 meter ham bands, in which case they're probably using a converted ham transmitter.

While some of these out-of-band stations are constantly covered in North America by interference from utility stations, others have clear channels, as long as conditions permit their weakly powered signals to be received. Unfortunately, when licensed, some move to authorized in-band frequencies, where they are usually covered up by more powerful stations from elsewhere in Latin America.

Adding to the DX challenge -- and fun -- is that the broadcasting scene is constantly changing. Competition in these small towns is stiff, and overhead is high. Just buying kerosene for a generator is a major expense.

Considering that many small stations don't gross more than ten or twenty dollars a day, it is hard to see how they have money left over for equipment and records. If there is an equipment breakdown, expensive replacement parts must be ordered from Lima. It may take months before the owner saves enough spare cash from his other businesses to fix the transmitter.

Despite the successes of a few stations such as Radio Chota, many do fail. Frequently, new stations come on the air, are heard well for a few weeks or months, and then are gone forever. It may seem like new stations come and go on a daily basis, teaching DXers to catch a new station today, because it may be gone tomorrow.

Playing "Musical Transmitters": Because of the difficulties of radio broadcasting in this part of the world, it's not unusual for stations to go off the air for several days, weeks, months, or even years. When an inactive station reappears, it's a good idea to make sure it really is the old station. After all, the owner may have decided to call it quits and sell the transmitter. In rural Peru, you never know for sure just who owns the transmitters, since some change hands frequently.

For example, in the early 1980s, Radio Acunta came on the air from Chota with a 100 watt transmitter on 5800 kHz. Later, the transmitter was moved to Bambamarca and rented to Radio San Francisco, a new station. However, Radio San Francisco didn't make it and the transmitter was soon back in Chota.

By mid-1985, Radio Acunta was having a tough time competing with crosstown rivals Radio Chota and Radio San Juan de Chota, each of which had a one kilowatt transmitter, so manager Victor Hoyos called it quits. The transmitter was sold, and ended up in San Ignacio, by the Ecuadorian border, where for several years it was used by Radio San Miquel Archangel.

Radio San Juan de Chota didn't last much longer, and its transmitter was sold to another new Bambamarca station, Radio Onda Popular (which is still on the air). Lately, from the town of Nuevo Cajamarca, near Rioja, Radio Nuevo Cajamarca has been heard on 5800 kHz. This is probably the old Radio Acunta transmitter with yet another owner.

Another "musical transmitter" got its start in Moyobamba, on the fringe of the Amazon jungle. In 1982, Radio Moyobamba announcer Miquel Quisipotongo Suxe founded his own station, Estacion C, using a 300 watt Framvel transmitter with a crystal for 6364 kHz.

The Moyobamba area is growing fast, and Miguel made enough money to invest in new equipment. He bought a higher powered transmitter, with a crystal for 6324 kHz; he sold the 6364 transmitter to another ex-Radio Moyobamba announcer, Porfirio Centurion. Porfirio called his soon-to-fail station Radio Moderna.

A few months later the transmitter ended up in nearby Saposoa, where it was used to broadcast under the name Radio Huallaga. This station, however, hasn't been heard in more than two years, so don't be surprised if you hear someone else from northern Peru on 6364 kHz one of these days -- there's no telling who owns the transmitter now.

Confusing as it may be, there is a silver lining for the DXer. By station counting standards, if a station name change is accompanied by a change in ownership, it can be counted as a new station. Therefore, over several years, it is possible to log the same transmitter on the same frequency three or four times -- and count it as a different station each time!

When to Hear Peruvians: In North America, the morning is the best time for Peruvian reception. Stations begin signing on at 0900 UTC, with most on the air by 1000. The stations can be heard until fadeout at sunrise, which in the winter can be as late as 1200 on the east coast.

In the summer, the opening can be almost nonexistent. Peruvians can also be heard in the evening, occasionally as early as 2300 in the winter, later in the summer. Usually the best reception is after 0200. Most stations sign-off between 0400-0500.

Unfortunately, many smaller out-of-band stations do not sign on until 1200 or later, so they can only be received in the evening.

For the most part, Peruvian stations broadcast in Spanish, and knowledge of Spanish helps in identifying them and picking out program details for reception reports. However, many stations in the central and southern Andean regions also broadcast in Quechua, which can be easily mistaken for Spanish. Although the two languages are phonetically very dissimilar, Quechua has borrowed hundreds of Spanish words.

Quechua is not the only Indian language used by Peruvian broadcasters. In the far south, around Lake Titicaca, a few stations broadcast in Aymara, a language widely spoken there and in neighboring Bolivia. Aymara, too, has borrowed numerous words from Spanish.

Many Peruvian stations heard on shortwave do not have set formats, like North American AM/FM stations. Instead, they program various types of music throughout the day, depending on the expected audience.

The first program of the day is nearly always a wake-up program aimed at the "campesinos," or peasant farmers. Other than a few crazy DXers, who else would listen that early in the morning?! These programs usually have names such as "Amanecer Campesino" (campesino dawn), "Mananitas Campsinas" (campesino morning) or "Buenos Dias . . ." (Good morning + name of town or province).

The announcers are upbeat, give frequent time checks, and sometimes even chastise their listeners with "Levantese! Levantese!" (Get up! Get up!). Since campesinos like folk music, this is the best time of day to hear traditional Peruvian huaynos (pronounced "whinos").

The most popular music of rural Peru, the huayno features a rapidly strummed guitar and high-pitched vocals. It is frequently accompanied by a quena (traditional wood flute), zampona (bamboo panpipes), charango (a small guitar-like instrument), arpa (harp), or guitarra.

Many DXers soon develop a liking for these exotic, haunting melodies. A good example of the sound of these instruments, and Andean music in general, is Simon and Garfunkel's song "El Condor Pasa."

Don Moore

Puno's La Voz del Altiplano is sometimes active on 5816 kHz.

Although many of the instruments are the same, huaynos are different from the Ecuadorian music played on HCJB.

Other programs follow throughout the day: romantic music for housewives, pop music for teenagers, radionovelas (soap operas) for everybody.

During the evening hours, in fact, just about anything can be heard -- although usually in program blocks. Don't be surprised if an hour of rock music is followed by syrupy romantic music, or fast moving tropical music. Each of these programs has its own name, such as "Discoteca de Hoy," "La Hora de Amor," or "Fiesta Tropical."

Getting Started: DXing the Peruvians is challenging; there aren't many DX frontiers as hard to crack as this one. Still, with a serious effort and dedication, it's possible to log 25 or 30 stations in just your first year. The way the stations come and go, many DXers with five or six years experience have logged more than 100.

Resources such as *Passport to World Band Radio*, log columns such as that in *Monitoring Times*, and an atlas with the departments clearly marked, are indispensible to DXing the Peruvians.

However, the most important step in successfully DXing Peru is keeping up on late-breaking DX news, so that when a new station comes on the air, you can try for it before it has a chance to shut down. Tuning in to Glenn Hauser's weekly DX news segments on Radio Canada's *SWL Digest* is the best way to keep up.

When sending reception reports to Peruvian stations, write in Spanish, and include mint stamps for return postage. At the moment, however, Peruvians are not particularly good verifiers. The Peruvian economy is a shambles; inflation in 1988 was around 2000 percent.

Under these conditions, most stations don't have the money or staff time for verifying. Many DXers report return rates of only ten or twenty percent on their Peruvian reports. Of course, any reply which is received is that much more treasured because of its rareness.

It's unlikely that the economic situation will improve before the 1990 presidential elections. If the economy does improve, maybe DXers will see the return of easier verifications that often included pennants.

The following list of stations should get you started on DXing Peru. Some of these are "regulars," while others can only be heard under good conditions. A few are so rare that they are only logged two or three times a year in North America.

North American DXers frequently wonder if some of these stations are even on the air. Yet, Latin American DXers report regular reception, so we know they are always possible, given the right conditions. So, turn on the radio and plug in the headphones, it's time to DX the land of the Incas. Buena sintonia! (Good listening!)

mt

3330 Ondas del Huallaga. If you ever hear weak Andean music mixing with CHU, this is probably the one.

3340 Radio Altura is possibly Peru's only other active 90 MB station. It's sometimes heard after 1000 sign-on; less frequently, evenings.

4300 Radio Moderna Broadcasts from Celendin, in Cajamarca Department from 2300-0500 daily. Has been reported a few times around 1030 also. It's usually covered by an RTTY station, but on occasion the Ute has been known to go off the air . . .

4460 Also in Celendin, Radio Norandina also is on the air from 2300-0500 daily, and also suffers from utility station interference. It is heard more often, however, though rarely very well.

4775 Radio Tarma is frequently heard after its 1000 sign-on, and sometimes as late as 0500 in the evenings.

4785 Radio Cooperativa Satipo is rarely heard, but try for it around 1000 sign-on, or evenings before its 0200 sign-off.

4790 From the Amazon city of Iquitos, Radio Atlantida has been a regular on 4790 for years. Often heard evenings until past 0500, and also in the morning.

4810 In the jungle town of Tarapoto, Radio San Martin is frequently heard in the morning after its 1000 sign-on.

4821 Radio Atahualpa is often one of the strongest 60 MB stations after it signs on around 0900-0930. Plays some of the best folk music in Peru.

4825 An educational station in Iquitos, La Voz de la Selva is owned by the Catholic church and managed by a Franciscan nun! Often heard in the morning, signing on at either 1000 or 1030. Some programs are in Amazon Indian languages. Don't confuse this with the much rarer Radio Sicuani on 4826!

4881 A new station, Radio Nuevo Mundo, is frequently heard between 0900-1100.

4910 This is a confusing frequency. Radio Tawantinsuyo, Radio Huanta, and Radio Cobriza Dos Mil all operate in this area, and a few years ago Radio Libertad de Trujillo did too. Any Peruvian heard here has to be

carefully identified.

4922 Ondas del Titicaca is sometimes heard after 0900 in the mornings with southern Peruvian folk music.

4935 Radio Tropical is a regular here in evenings and mornings.

4990 With a ten kilowatt transmitter and a clear channel, Radio Ancash is one of the easiest Peruvians to hear. It can be heard many evenings and most mornings, usually with folk music.

4995 A "puro huayno" station in the mountain city of Huancayo, Radio Andina can sometimes be heard in the evenings, but is best heard in the mornings after its 0900 sign-on.

5030 You have to get up early to hear this one! Radio Los Andes signs-on at 0900, but by 1100 it is usually blocked by Radio Impacto in Costa Rica.

5270 Radio Onda Popular, from Bambamarca, is a rare evening catch.

5661 La Voz de Cutervo is another station rarely heard in the evenings.

6011 Radio America is sometimes heard in the morning before 1000 when the Venezuelan Radio Mil Cuarenta signs-on.

6115 Lima's Radio Union can sometimes be heard mornings if La Voz del Llano in Colombia is sleeping-in. Radio Union has occasionally stayed on all night.

6323 Estacion C is occasionally heard mornings and evenings.

6726 Once a regular station, Radio Satelite has been less frequently been heard in recent years. Usually only heard in the evening.

6815 Located in the little village of Pandalle, outside Cutervo, Radio Universo is a rare catch. To save on kerosene for the generator, the 100 watt Heathkit transmitter is only fired up once a week on Sunday night from 2300 to 0300 UTC Monday, according to station manager Miguel Lozano Tantalean.

Don Moore

Unable to compete in the crowded Chota market, Radio San Juan de Chota was only on the air a few months in 1985-6.

9655 No one knows why a one kilowatt station in a little town in northern Peru would broadcast on 31 meters, but Radio Norperuana does. It seems to be irregular, but sometimes puts an unbelievably strong signal into North America around 1200.

9675/9950 A Protestant missionary station, Radio del Pacifico can also sometimes be heard in the mornings around 1200-1300.

Theresa Bries

Celendin:
Radio Town of Northern Peru

Huancabamba, Mendoza, Rioja, Juanjui, Santa Cruz, Cutervo, Chota, Bambamarca, Huamachuco . . . the radio towns of northern Peru number three or four dozen. For the most part, these towns are provincial (county) capitals with 5,000 to 15,000 inhabitants. They are commercial centers for the surrounding villages and farms, although a few like Huamachuco depend on mining. There is little unique about any of them.

Celendin, a typical northern Peruvian town, lies about a hundred kilometers east of the city of Cajamarca, five hours by dirt road on the local bus. One sixth of the province's 70,000 inhabitants live here. The Catholic church towers over the central Plaza de Armas. As in many Peruvian towns, gardeners trim the plaza's shrubbery into animals and geometric shapes. Celendin's dirt streets are flanked by one and two story buildings of adobe or cement block, roofed with moss-covered clay tiles. The scattered business district is comprised of several general stores, a few basic and somewhat rundown hotels, the bus company office, and a couple restaurants and bars.

At 8,500 feet above sea level, the surrounding Andean valley is one of the garden spots of northern Peru. Although some small scale gold, silver, and copper mining is done in the nearby mountains, it is agriculture that keeps Celendin prosperous. The climate is perfect for growing potatoes and barley, and for raising dairy cattle and sheep. Celendin is known throughout the region as the best producer of "manjar blanco," a rich, soft caramel made by slowly boiling milk and sugar. The sweet is spread on bread and used to fill pastries. Manjar blanco and other produce is trucked to the coastal city of Trujillo.

Peruvian towns often have a special handicraft, and Celendin is no exception. When a campesina (peasant woman) isn't cooking or cleaning, her hands may be busily weaving a purse, a hat, or a small basket out of thin straw called "paja." The plant is cultivated because the handicrafts bring extra income to the peasant households. Some paja products are sold to stores in Celendin, but most are sold in Cajamarca tourist shops.

Celendin is the staging point for journeys from Cajamarca Peru's northern interior. Buses don't make the trip, but for a small fee it's easy to hitch a ride to Chachapoyas on one of the frequent cattle trucks. The two day journey involves extremes of temperature and road conditions: either clouds of dust or rivers of mud, depending on the season. But, if one endures the ride, it's easy to continue on from Chachapoyas to Rioja, Moyobamba, and Tarapoto.

Theresa Bries

Bicycle-taxis typically used by the Indians of southern Peru

Shortwave in Celendin: Since June 1982, when Radio Moderna, 4300 kHz came on the air, Celendin has been a DX target. Though the history of radio here has been rocky, Celendin has, in fact, been more active on shortwave than most of the other towns of the region. The town has one of the strongest municipal generators in Cajamarca department. Unlike many other places where the municipal generators can't power radio stations, potential stations in Celendin don't have the added expense of buying their own generator. This has, however, restricted their broadcasting hours. Since the generator is only on from 6 p.m. to midnight (2300-0500 UTC), all of Celendin's stations follow that limited schedule.

Not long after Radio Moderna came on the air, Radio Celendin appeared on 7054 kHz. Celendin's third station, Radio Gran Pajaten, got its start in mid-1983 on a highly variable frequency of around 4180 kHz. Radio Nuevo Eden broadcast briefly on 6815 kHz from April to June 1984. In January 1985, Radio Frecuencia Siete, 7010 kHz, added yet another voice to the town's radio scene.

With so many shortwave stations, Celendin was high on my list of places to visit when I traveled to Cajamarca department in mid-March 1985. A look at the stations of Celendin would be a look at small town Peruvian radio. Indeed, broadcasting in Celendin has been a microcosm of broadcasting in northern Peru.

Radio Frecuencia 7: Radio Frecuencia 7 was the newest kid on the block when I visited Celendin. Striking postal workers in the Plaza de Armas pointed me in the direction of San Martin street. Two blocks away, above the door of a typical one story adobe row house, the words "Frecuencia 7" were painted in very small black stenciled letters. The rooftop antenna was simply a twenty foot wire sloping down from a ten foot pole to the roof.

The main business here was not broadcasting, but rather owner Gregorio Sanchez Aruajo's electrical repair shop, located in the front room of his house. Radios, turntables, and tape recorders were scattered about in various stages of disassembly. Old calenders and posters added color to the white adobe walls. The floor was unpainted cement.

The radio station occupied a corner in the back of the shop. The entire station was setting on two rough, handmade wooden tables. The fifty watt transmitter, about twice the size of a shoebox, had been made locally by a self-taught electrical engineer. Gregorio hoped he could make it more powerful. Beside the transmitter was a cheap turntable, similar to those found in U.S. discount store toy departments. The station's record library consisted of about 100 forty-fives stacked on a shelf. There were no LPs.

A microphone and a "console" rounded out the equipment. The console, a little wooden box with three knobs and a couple of wires coming out of the back, looked just like a homemade antenna tuner. There was not even a cassette deck or cassette recorder in the studio corner, making it the first and only station I've seen without cassette capability. Of course, Gregorio could always borrow one of those in his repair shop. Provided he fixed it first.

A quiet man in his late 30s, Gregorio pointed out that the station had begun transmitting on January 20, exactly two months before. He and his teenage son were the sole announcers. So far the station was only making a little money, through the sale of communicados (personal messages) and record dedications. What little commercial advertising there was in Celendin went to the more established stations. But Gregorio still had his hopes for the future.

"Yes, we are very small. I started out by working as an announcer at Radio Celendin and later Radio Moderna. I learned how to run a small station, and I feel I know enough about the business to make mine the best in Celendin. I hope to raise power little by little, buy new equipment when we can. Eventually I would like to have 1,500 watts and our own generator so we could transmit all day long. That would be a first for Celendin. It will take time, but we will do it."

Gregorio was constantly thinking of the alternative -- failure. The year before, a friend of his had operated Radio Nuevo Eden, or "New Eden" (this is what Celendinos like to call their green valley). This Celendin station was reported by DXer Juan Carlos Codina in Lima, but never heard outside Peru. Gregorio said it had operated with only fifteen watts, but couldn't make it financially and finally had to close down.

Radio Moderna: On a side street, about seven blocks from the plaza, was a two story white adobe building with a wooden "Radio Moderna" sign over the door. Inside, the dirt-floored room had a table and chair in the center and a steep wooden staircase on one end. This was the station's reception room, where a staff member took down the communicados (personal messages) that listeners paid to have read on the air. Up the staircase, on the second floor, was the station.

I had dropped by this station in the morning, before going to Radio Frecuencia 7, but the door was locked and bolted. Since it only broadcasts in the evening. there was no need for anyone to be there. However, when I dropped by after lunch, teenage announcer Pompeyo Silva Pereya and two friends were waiting for me. They had heard from Gregorio that a visiting gringo was interested in seeing their station.

Pompeyo explained that the station was owned by Herbert Palaez Chacon, a businessman who lived in Cajamarca but rarely came to Celendin. Senor Palaez also owned an AM-only Radio Moderna in San Marcos, south of Cajamarca. The station manager, a local businessman, was out of town for a few days. Pompeyo didn't know anything about the station's plans or its brief history. His job was to spin discs and make announcements, but he could give a friendly tour.

Upstairs, the eight by fifteen foot room had a roughly hewn wooden floor and a little furniture: a table with a manual typewriter and a chair. Posters of Spanish singers adorned the walls. Along the back wall, a window provided a glimpse of the cramped studio. It was as small and stuffed as the other room was empty. A large console, two turntables, and a cassette deck filled a little desk. Records, both LPs and 45s, lined the walls overhead. The DJ barely had enough room to sit down.

Through another doorway, the "guides" led me to a third small room, housing the station gem, a 250 watt transmitter. A heavy coaxial cable led the signal under the eaves and to the rooftop dipole. Two beds were the only other furniture in the room. These, Pompeyo explained, were for the announcers. Because the station didn't go off the air until late at night after the power went off, the announcers on duty slept at the station instead of walking home in the pitch black streets. He then smiled and said they were occasionally used for other purposes, too.

Radio Celendin: Radio Celendin wasn't as easy to find as the other stations. But finally, with the help of a storekeeper, I located it on Dos de Mayo street, about five blocks from the plaza. There was no sign over the old wooden double doors. The doors were locked throughout the afternoon, and I realized I would have to drop by in the evening when the station was on the air.

When my wife and I arrived about 7:30 p.m., the double doors were propped open. A bench and posters making a half-hearted attempt to cover bare studs furnished the entryway. Over the inner door leading to the studio was a beautiful painted wooden sign proclaiming the station to be "a wave of love, peace, and culture."

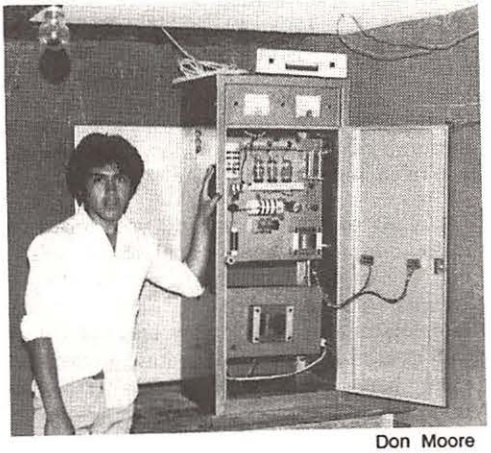
Owner Jose Camacho Villar was spinning discs. The studio was a very cramped little room, about six by eight feet. Inside, two tables arranged in an "L" were topped with two turntables, cassette player, console, and tabletop transmitter. There was just enough room to squeeze by the table and into the room.

Not long after our arrival, an announcer came and took over, freeing Senor Camacho to talk to us, and to sign and stamp the prepared QSLs I had brought along with several reports. He thanked us for our compliments on his beautiful station sign, and pointed out that the station had another motto on its official rubber seal, "transmitting from blue skies of Eden." Influenced by that slogan, one of his announcers started the ill-fated Radio Nuevo Eden.

A friendly, easy-going man in his late forties, Senor Camacho noted that his station was actually the oldest in Celendin. He had been broadcasting on and off for more than twenty-five years, whenever he had working equipment and the time. In 1982, after Radio Moderna came on the air, he bought a home-made Peruvian two-hundred watt tabletop transmitter. Before that, he used very low powered equipment, and had never been heard (or heard of) outside Celendin. With other more profitable business interests, he still plans to put much effort into the station.

Radio Gran Pajaten: For the first year and a half of this station's existence, it was only heard irregularly by a few South American DXers. Then, in December 1984, it changed its frequency to 4485 and apparently added a newer, more powerful transmitter. Suddenly it was well-heard in North America. Three months later, it disappeared just as quickly. The DX world learned why when a DXer received a verification letter mentioning that some parts in the transmitter had burned out on February fifth. In the beginning of March, it was heard again, but weakly.

When I arrived in Celendin in mid-March, Radio Gran Pajaten was no longer on the air. Walking around town, I discovered the station just around the corner from Radio Moderna in another two story white adobe building. A wooden station sign hung over the locked door. From a neighbor, I learned that owner Milciades Echeverria Puitiza had gone to Lima for replacement transmitter parts.



Don Moore

Announcer Pompeyo Silva Pereya shows off Radio Moderna's 250 watt transmitter.

Epilogue: Since that visit, radio in Celendin has continued to develop and change. Gregorio Sanchez's Radio Frecuencia 7 was occasionally heard by DXers throughout 1985, and verified several reception reports. It was last heard in March, 1986. In early 1988 a DXer received a verification letter from Radio Moderna, signed by announcer Gregorio Sanchez. Apparently Gregorio's dream of making Radio Frecuencia 7 the best station in Celendin didn't succeed.

At Radio Celendin, Senor Camacho apparently decided that his other businesses needed more of his energies. His station hasn't been reported since December 1985, when it changed frequency to 5085. In June 1985, a new station, Radio Norandina, signed on higher powered transmitter on 4460 kHz. Though not common, Radio Norandina is logged regularly in North America. This new competition probably helped do in Radio Frecuencia 7 and Radio Celendin.

Radio Moderna is till there, however, and continues to broadcast on 4300 kHz, where it is usually covered by a radioteletype station in North America.

As for Radio Gran Pajaten, nothing has been heard from it since that weak broadcast in early March 1985. Apparently replacement parts were more expensive than the owner imagined. Since the fall of 1988, a new station named La Voz de Celendin has been logged on Radio Gran Pajaten's old frequency of 4485. Although well-heard by DXers in South America, it has only been weakly heard in North America. In all probability this is Radio Gran Pajaten's old transmitter. Possibly, the owner finally had it fixed, and put the station on the air under the new name. But name changes at Latin American stations are rare, and my bet is that, in need of cash, he sold the useless transmitter at a bargain price to someone else who had the money to fix it. The real answer won't be known until someone at the station takes the time to answer a DX report, and explains the station history.

So, of seven shortwave stations in Celendin, only three are still around today. Radio Moderna and Radio Norandina are probably around to stay, but La Voz de Celendin is so new that I wouldn't place any bets on its survival. Celendin's stations are not easy to hear. But, if Latin American conditions seem to be good, and it's between 2300-0500, try for the active ones on 4300, 4460, and 4485 kHz. Besides that, there are still Radio Celendin's 200 watt transmitter and Radio Frecuencia 7's 50 watt transmitters unaccounted for. They could pop up on the air anytime. Celendinos like to start radio stations.

-- Don Moore

Make a Scanner Your Copilot

by Mark Weigand

Probing your environment as you drive

Many people I meet are fatalistic about events such as auto accidents, severe weather, natural or man-made disasters, and other risks of everyday life. It seems the less they know, the happier they are.

Scanner users, on the other hand, seem to fall into exactly the opposite category of folks. Not only do they want to know what is happening right now, they want the behind-the-scenes story rather than the watered-down version that often ends up being reported on the news.

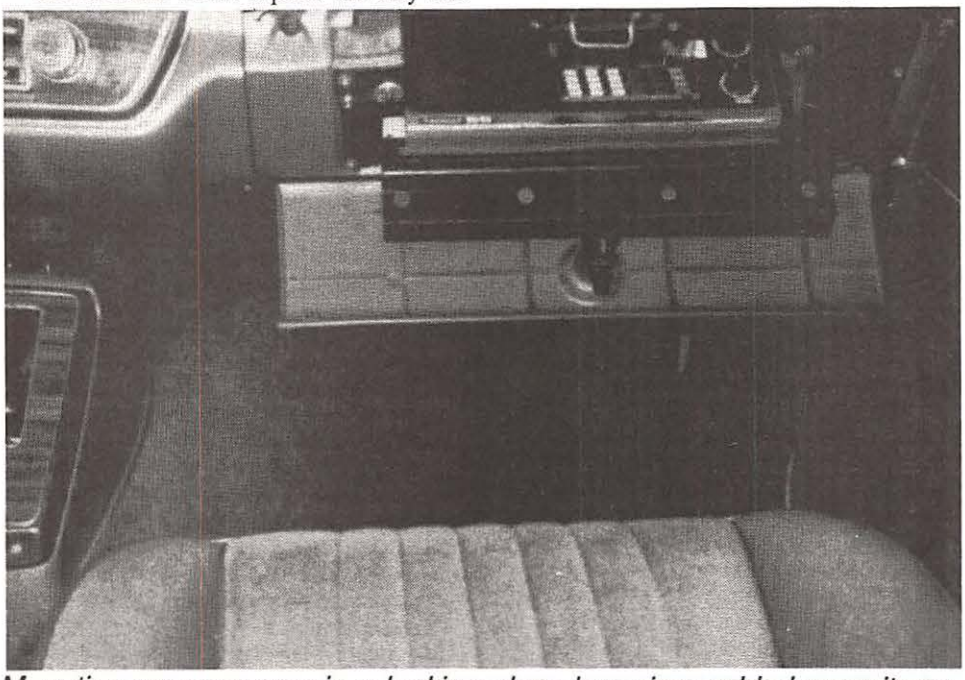
As every experienced traveler knows, that modern euphemism called a "freeway" can suddenly slow to a crawl. Not fun if you have a deadline to meet, a meeting to attend or a family waiting. How often have you heard traffic and weather reports on local radio stations only *after* being caught in a storm or finding that your usual route has become a parking lot?

But accurate traffic reports are only one reason to "go mobile" with your scanner. If you live or work near an agency that responds to emergencies, or uncomfortably close to an industry that routinely uses or ships hazardous materials (for example), you have two more reasons to scan the airwaves.

If there are regular seasons of severe weather in your area, a scanner can help keep you informed about weather-related emergencies better than your local disc jockey. Whether your interest involves railroads or airshows, or you want to keep tabs on crime in your area, you are in good scanning company.

Finally, if you live within 40 miles of an airport, coastline, or military installation, you're in for some first-rate scanning!

In all of these examples, your need to make informed decisions about health, safety, and convenience can be assisted by using a scanner in your vehicle. What's more, mobile scanning can be very entertaining as well as useful. The usual solitary, uneventful drive becomes -- with a scanner -- an informative and often exciting experience.



Mounting your scanner in a locking glove box gives added security as well as conserving space.

Your vehicle becomes an all-weather monitoring station for a vast array of communications including police, fire, aircraft, government, amateur, marine, military, news media, mobile telephones, sporting events, weather broadcasts, emergencies of all kinds, even satellites!

Installing Mobile Scanners

For comparison, a mobile scanner is more difficult to install than a radar detector but much easier to install than an auto stereo system. There are only two cables to connect -- the power cable and the antenna cable.

Most scanners come with a power cable, which is connected to a positive 12 volt source (such as the fuse box) and to any convenient body ground (usually the nearest grounded metal bolt or screw). Connect the antenna cable to the back of the unit and all wiring is complete!

Most of your time and effort will probably be spent in finding a convenient location in your vehicle where you can mount the radio in a safe, secure, and hopefully, inconspicuous place.

Common locations include under the dash, in the dash or console, or in the glovebox, depending on the size and accessibility of the radio. Generic radio installation kits are available from many auto parts stores and from Radio Shack.

Radio "slide-in, slide-out" mounting brackets are available so that a radio can be removed and reinstalled in one or more vehicles, or placed in the trunk while you are away from the vehicle.

Mounting a handheld unit can be as simple as using some hook-and-loop material in a convenient location on the dash or vehicle door. Power can be provided with a cigarette lighter adapter/plug if needed for extended use, but an external antenna will still be needed.

On some vehicles, radio interference can be caused by the engine or electrical accessories. Most interference can be identified as a consistent popping sound (ignition noise) or as a whining sound (alternator

noise), both of which vary with the speed of the vehicle's engine.

Noise filters which reduce or eliminate interference are available from many retail electronics stores. Most newer vehicles will not need noise-reducing filters.

If reaching the scanner's on-off switch is difficult, you can easily mount a toggle switch in line with the power cable in a more convenient location. A lighted power switch adds a nice touch and helps you remember when the scanner is switched on.

When mounting a scanner inside an automobile glovebox, the back of the glovebox can be removed to allow for space and wiring. A remote lighted toggle switch can be located on the dash or center console for switching the scanner on and off easily. The glovebox light assists with nighttime scanning, and a locking glovebox increases security.

An external speaker in the dash, door, or elsewhere can be connected to the scanner's external speaker jack for better listening.

Table 1
National VHF/UHF Frequencies for Monitoring

40.5000	Army search and rescue
41.5000	Army aircraft
47.4200	Red Cross
121.500	aircraft emergency
122.750	government air to air
122.900	search/rescue/government aircraft
123.050	helicopters
123.075	medical helicopters
123.100	search and rescue
123.450	air to air
126.200	military towers
129.450	San Francisco/Chicago/Denver center aero
143.460	Air Force MARS
143.990	Army MARS
146.695	national ham emergency
148.150	Civil Air Patrol net
148.215	Air National Guard
148.515	military aircraft
149.175	Strategic Air Command
149.235	Strategic Air Command
152.810	mobile phones
154.225	fire mutual aid
154.280	fire mutual aid
154.295	fire mutual aid
154.370	fire intersystem
154.905	state police
155.160	search and rescue
155.370	police intersystem
155.475	police emergency
156.800	maritime emergency/Coast Guard
162.550	24-hour weather broadcast
165.375	Secret Service
167.562	FBI
168.745	ham bulletins
169.875	Federal Emergency Management Agency
170.110	military aircraft
170.200	federal disaster net
170.875	federal prisons
241.000	National Guard
243.000	military aero distress
381.800	Coast Guard air
418.050	federal government
453.600	police information
462.975	medical helicopters
463.175	paramedics
464.100	medical helicopters

Mobile Scanner Antennas

Many companies manufacture antennas for mobile use. Be sure to buy one that covers the band(s) in which you are most interested. You will also need to decide on the type of antenna mounting method.

For temporary use or for switching between vehicles, a magnetic mount antenna works well. These tend to work best when mounted in the center of the vehicle's roof. Specialized mounts are available for top, side, bumper, fender, or gutter mounting. Or, you can easily build your own using commonly available hardware.

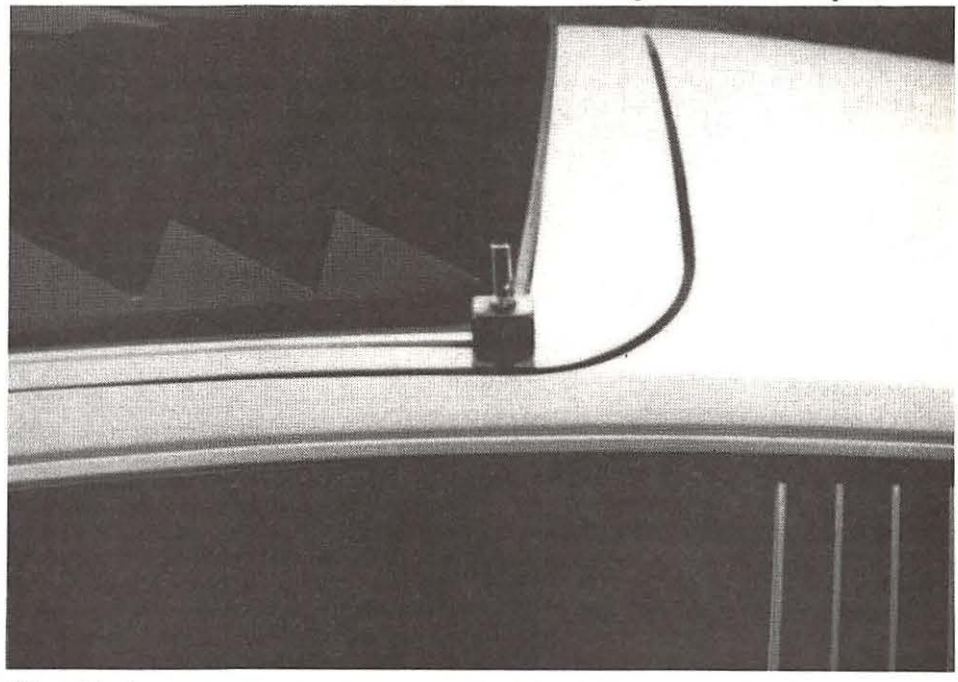
For example, although standard Citizen's Band antennas will not work adequately with scanners, their mounting brackets and hardware (other than the loading coil) can be easily adapted for scanner use. A basic scanner antenna can be mounted on one side of an automobile roof using an inexpensive CB "gutter mount" antenna. Similarly, a "lip mount" can be used for locating the antenna on an automobile trunk without drilling any holes. Both the mount and whip are held in place by set screws.

When using CB antennas, the loading coil should be removed and the whip cut to 18 inches. The antenna cable will usually need two spade lugs at the antenna end and a Motorola plug at the radio end. The whip can often be taken off without removing the entire antenna mount.

In general, the ideal one-quarter wavelength antenna for a given frequency of interest can be calculated using the formula: Length (in inches) = 2808/frequency (in MHz). Since the length of antenna cable required will be very short, RG-58U, RG08X, or RG-59U coaxial cable can be used.

If you make your own antenna, chances are you will need to purchase and install the correct connectors at each end of the cable. Most scanners require a Motorola type connector. This is the same connector used by standard auto radios. Just be sure that the center conductor goes to the metal whip of your antenna and its braided copper shield is grounded to the car body at the antenna mounting location.

Some scanners will operate effectively using a standard vehicle antenna. If you try this option (perhaps to draw less attention to your vehicle), adjust the antenna to about 18 inches in length for better reception.



What kind of antenna mount to use? You have several options, but the best one depends on your requirements.

Adapters are available which allow you to use your standard vehicle antenna for both your vehicle's own radio and your scanner. This effectively gives you a dual-purpose "disguise" antenna and should improve your scanner reception at the same time.

Improving Reception

Some special reception considerations apply when a scanner is mounted in a vehicle. First, make sure that any radio interference is not being caused by your own vehicle. Such interference will cause your scanner to "lock on" and stop scanning until the interference ends. Deactivating the radio's scan-delay feature on interference-prone channels can help prevent lock-ons to noisy channels.

Use your unit's squelch control and channel lockout feature to help control noisy reception. Some squelch controls seem to be sensitive to the temperature inside a vehicle and may need to be readjusted periodically while driving.

Some scanners have limited audio output and a small speaker which is difficult to hear while driving. Adding an external speaker or using an auto radio speaker can help. If all else fails, set the scanner to manual and listen to one favorite channel at a time.

What's There to Hear?

In most urban areas the airwaves are crowded and you may hear harmonics as well as interference from other vehicles, power lines, industrial equipment, etc. Just remember, it's all part of the urban jungle you are probing for information.

You'll hear it all: business, industry, government, legal and sometimes illegal communications, lusty phone calls, mechanical problems that airline passengers never hear about, traffic and medical helicopters, military bases, trains, airshows, the National Weather Service, hospitals, and much more!

In some ways, scanner monitoring is like taking the pulse of your city. During an emergency, it can be a lifesaver. For example, during several years in Denver, Colorado, I have monitored communications regarding a railyard chemical spill, numerous severe storms, a munitions truck rollover accident, air search and rescue operations, high speed chases in progress, airshows, training exercises at military bases and defense plants, and an airline crash site.

Having advance information about such situations is always desirable. It can prevent you from unwittingly driving into a dangerous situation and impeding the work of emergency personnel. It can also provide time enough to warn a spouse or friends.

On the lighter side, mobile scanner monitoring can be quite entertaining as you hear what happens "behind the scenes" in your community. You can also learn the buzzwords and terminology used by media communicators, hams, pilots, law enforcement and medical professionals. There have even been cases where alert scanner users have notified authorities of crimes in progress.

Aside from the fact that a scanner is a commuter's delight, what else can you do with a mobile scanner? Another use can include checking the range of your cordless telephone. Or, with the addition of an FM handheld unit, one-way communications can be established between a person on foot and your vehicle, or between two vehicles.

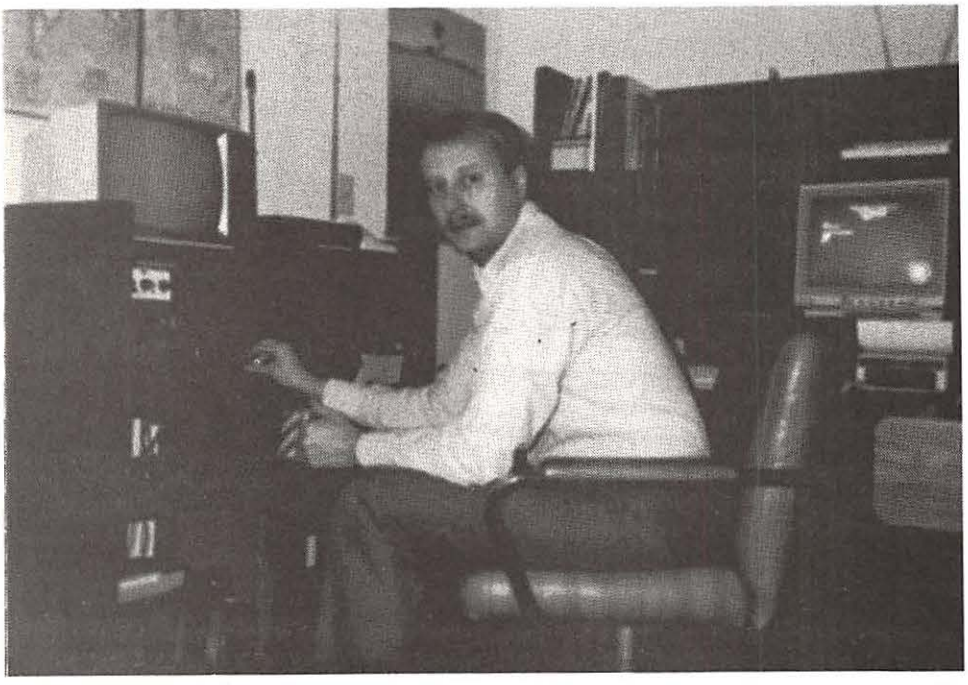
On driving vacations, scanning can become a family affair. Unfamiliar cities can be scanned using the "search" feature of most programmable radios. Frequency lists for most cities are available from radio electronics stores. Table 1 lists some of the most active scanner frequencies nationwide.

As with other types of nonbroadcast communications monitoring, Section 605 of the Federal Communications Act of 1934 applies. Basically, it states that you cannot discuss the details of what you hear or use any information for personal/financial gain. In the case of monitoring the 800 MHz cellular telephone band, the recent and controversial Electronic Communications Privacy Act also applies. In a few states the use of scanners in vehicles is prohibited. Check with your local radio electronics shop for details.

Be prepared for fast breaking events by having frequency lists set aside for various types of emergencies and for seasonal occurrences such as severe storms in your area. Statewide and commonly shared intersystem police and fire frequencies are especially useful. Have a list of relevant frequencies for newsworthy events such as VIP visits, military training exercises, aircraft search and rescue, etc. Pay attention to advance announcements of special events in your local media.

A multi-band, multi-channel scanner can put you in contact with the world outside your vehicle on an unprecedented scale. You will be warned, informed, and entertained during otherwise "unproductive" driving time. You will know more about your community and your environment. You may hear tomorrow's headlines as they occur.

So, even if you are up to your hubcaps in traffic delays, your scanner will still be operating at the speed of light. Good luck and good scanning!



Mark Weigand has been a radio monitor since 1977 and an MT subscriber since 1982.

Monitoring Times welcomes your considered comments, questions and opinions on the world of radio. Address them to "Letters," PO Box 98, Brasstown, NC 28902.

Get Acquainted with the Ham Bands

by Bob Grove WA4PYQ

Many newcomers to ham radio -- to radio in general -- have little understanding of the characteristics of different frequency ranges. Many initiates are puzzled as to what to expect when they tune up on various bands.

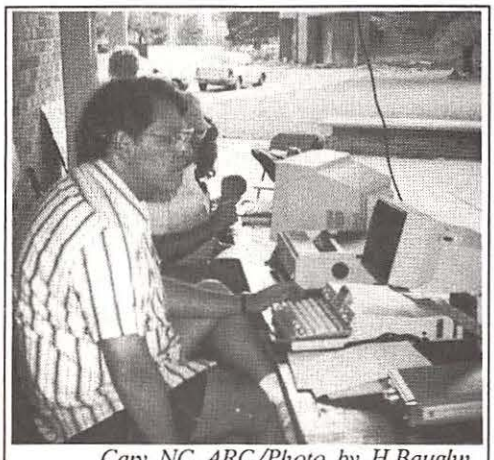
This month *MT* takes a look at the HF (high frequency -- "shortwave") spectrum with an eye on expectations for each amateur band.

As a general rule, Morse code and radioteletype can be used anywhere in the band but, by agreement, will be found at the lower end of each frequency range. Voice, on the other hand, will always occupy the upper portion of each band.

160 METERS

Just above the medium wave broadcast band is the "top band": 1.8-2.0 MHz. A favored habitat of "old timers" working "skeds" (scheduled contacts), daytime range is generally restricted to a few hundred miles, opening up to a thousand or more miles at night.

Under certain conditions, especially during winter nights, global coverage is possible, normally in CW (continuous wave -- Morse code) mode. Voice communications are usually in LSB (lower sideband), with AM (amplitude modulation) frequently heard among the stalwart pioneers.



Cary NC ARC/Photo by H.Baughn

As a general rule, Morse code and radioteletype can be used anywhere in the band but, by agreement, will be found at the lower end of each frequency range. Voice, on the other hand, will always occupy the upper portion of each band.

During Field Day, you will hear all bands, all modes, including packet transmissions.

80 METERS

The range 3.5-4.0 MHz is very popular for regional nets (networks), with the upper portion of the band (75 meters) used for LSB. Distances are several times greater than on 160 meters, with winter nights prevailing.

40 METERS

7.0-7.3 MHz is shared with international broadcasters, clearly apparent at night when long distance opens up for hams and broadcasters alike. Unfortunately for the low-powered hams, the broadcast powerhouses win!

While winter evenings -- especially early morning hours -- are especially kind to 40 meters, even daytime contacts of 1000 miles or more are routine. Occasional AM voice communications may be heard, but the majority will be LSB.

30 METERS

Added fairly recently to the amateur allocations, 10.1-10.15 MHz is useful day and night. CW and RTTY are the exclusive modes, providing reliable communications over thousands of miles.

20 METERS

The 14.0-14.35 MHz band is the workhorse of amateur radio. Here will be found worldwide communications and wide area nets featuring just about every specialty interest. During hurricanes and earthquakes, transcontinental and intercontinental relief and morale messages will be heard continuously.

Although propagation (radio wave paths) will change throughout the day and night, "skip" (signal reflections) off the ionosphere (electrically-charged upper atmosphere) permit global communications even beyond daylight hours, with favored time being twilight and least favored late at night.

The 20 meter band is populated by tongues of many nations, with all voice transmissions in USB. This is "Kilowatt Alley," home of the powerhouse hams using enormous beam antennas for that competitive edge in worldwide DX (distance) contests.

17 METERS

During 1989, the 18.068-18.168 MHz band became available to US amateurs. Several other countries had 17 meter privileges many months earlier, but it took a while for military users to gradually abandon the range to the hams.

Not as densely populated as 20 meters, worldwide coverage is possible during daylight hours with low power and simple antennas. USB is the voice mode.

15 METERS

Largely dependent upon sunspot activity for its effectiveness, the 21.0-21.45 MHz portion of the spectrum shares the long distance capabilities of 20 meters and the low-power effectiveness of 10 meters.

The 15 meter band is less dependable than 20 meters on a continuing basis, being affected by sunspot activity and most useful

Never before has so much listening been available to SWLs and hams.

during the spring and fall. It generally offers some periods of activity -- sometimes superb activity -- during the daytime 12 months of the year.

15 meter voice communications all utilize USB.

12 METERS

Another recently-added swatch of spectrum, 24.89-24.99 MHz is still sparsely used. Even more sporadic than the lower frequencies, long distance communications depend on sunspots to affect the ionosphere, supporting skip at these frequencies. Voice communications are USB.

12 meters is predominantly a daytime band.

10 METERS

Many hams claim 28.0-29.7 as their favorite band. There is something venerable about it. Transmitter power seems to be of no consequence in worldwide coverage. There is a camaraderie shared by operators here, possibly because of the precarious nature of the band's dependence upon solar activity.

The recent addition of Novice class voice privileges in the 28.3-28.5 MHz portion has provided new life to the band. While most voice communications are USB, converted CB radios are heard on AM (remember, the citizens band is just 1 MHz lower). FM (frequency modulation) is a favored mode above 29 MHz, with repeaters heard above 29.4 MHz.

Photo courtesy Ike Kerschner

KD3JP sorts out a pile-up during a DXpedition.

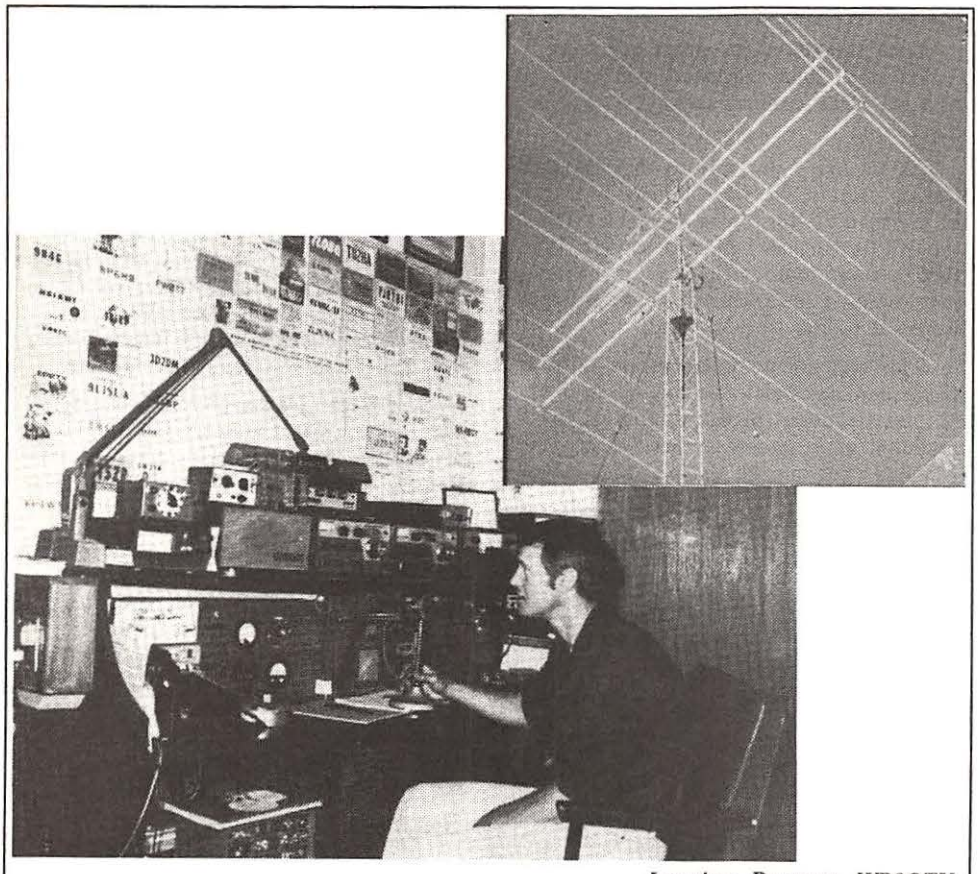
With high gain antennas small and easy to build, and low power the rule rather than the exception, 10 meters is a fun band, populated by relaxed hams. On-air members of the Ten-Ten Club keep the band in the popular eye.

So there you have it, a thumbnail sketch of the amateur HF spectrum. When signals are strong on any of these bands, adjacent broadcast band activity will be heard. Conversely, if there is strong signal activity from distant broadcasters in the HF spectrum, the closest ham bands will also be active, generally to the same areas of the globe.

With the dependence of the shortwave spectrum on sunspot activity, the present record-setting peak in sunspots assures unprecedented utilization of the upper high frequency range. Modern high-sensitivity receivers make reception even better than in the past.

Never before has so much listening been offered to SWLs and hams. Go for it!

mt



Jonathan Demaree, WB9OTX

"Kilowatt Alley" is the home of the powerhouse hams using enormous beam antennas for that competitive edge in worldwide DX contests.

Brussels Calling

by Andy Ross

During the summer of 1985, my wife and I set out to explore the country of Belgium. I expected to see the great tourist sites like the Grand Place and Mannekin Pis in Brussels, but was really more interested in some of Belgium's finer offerings. Among these are the world's greatest variety of beer styles which include beers made with the addition of cherries (kriek) and some strong monastic ales made by Trappist monks.

I was also hoping to get an inside look at the BRT (Belgian Radio and Television), which is the voice of the Flemish community in Belgium.

I had been a regular listener of the BRT for a short time before deciding on our trip to Belgium. During that time I became a member of the BRT listeners' club and began to get a good perspective on the happenings in Belgium through the BRT's regular program to North America, "Brussels Calling."

On arriving in Brussels, we knew that we were in for a terrific week. The Grand Place was packed with tourists making their way to the many cafes, museums, and shops that are located in this central square. Only a couple of blocks away we discovered the "restaurant street" that presents an endless assortment of some very fine eating establishments. Besides all of the usual tourist attractions, we were really in luck since the BRT's annual Open Door Day was scheduled to take place during our stay in Brussels.

After a short stop at the Tourist Information Office, we were confident that we were on the right bus to take us to the BRT center. Finally we arrived at the BRT and were immediately impressed with the design of this large facility. Inside, the excitement of Open Door Day was just beginning.

There were plenty of refreshments including soda and beer (remember, this is a country where you can get a beer at McDonalds), and plenty of BRT listeners. Although there were many fellow listeners present, most seemed to be Belgians interested in the Dutch language broadcasts.

Within a few minutes, we were not alone. At our table we were joined by none other then Colin Clapson and Liz Sanderson, two of the hosts of "Brussels Calling." Since they host a program that is broadcast to North America, they were very glad to meet with a couple of listeners from the United States. Can you imagine my excitement, spending an afternoon with two of my favorite shortwave radio personalities talking about everything from who makes the best kriek to who has the best soccer team?!

Then the formal program began in Dutch, and Colin suggested that we move on to a more exciting activity, a tour of the station.

As we made our way to the "Brussels Calling" studio, we were joined by a group of German "DXers" who were also fans of the BRT's English language service. We took a short look at the production area, met some of the technical crew and then were off to the studio.

This was not going to be just a "tour." Colin had decided to actually do a "Brussels Calling" broadcast for us. In addition, as a special feature for his Mailbag program, he decided that it would be fun to interview us on the air. All of a sudden my fun at the BRT was turned into nervousness. Thinking about the power of radio and the idea that my voice would be heard around the world, my mind was going blank.

In the meantime, one of the German "DXers" was on the air and doing an excellent job. He was doing so well that it was difficult for Colin to silence him. Finally my turn came. What did I say? It's hard to remember exactly, but something about how I was having a wonderful time in Belgium and how I was hoping that Anderlecht would beat Ghent in that evening's soccer match.

After all of the excitement, it felt good to spend a relaxing evening in our room at Hotel LaLegende. What better way to relax than by scanning the airwaves. Although I had only brought a medium wave receiver with me on this vacation, it was interesting to hear many of the same programs that I normally listen to on shortwave being broadcast on medium wave to Europe.

I must have been listening to the news from Radio Tirana, because before long my eyelids were getting heavy. Not much later though, I was awakened by my wife who was apparently doing some serious bandscanning. This was amazing because at home she is the type who would rather listen to local talk radio rather than hear the latest from Radio Australia or Deutsche Welle. I couldn't imagine what rare DX catch she could have found.

So I slipped on a pair of headphones and heard Colin Clapson's voice announce, "Today we have a special edition of P.O. Box 26...and here's a listener from Philadelphia..."

Today I'm still a regular listener of the BRT, and am anxiously awaiting the results of their latest listeners' contest. The grand prize, a round trip for two to Brussels.

mt

The author, center, and two technicians from BRT in Brussels.

If you have a story of how radio has played a part in your life or the life of your community, send it to Monitoring Times. If accepted for publication, we'll send you $50.00. All stories should be true, real life events. Manuscripts should be approximately 1,000 words and must include at least one clear photograph.

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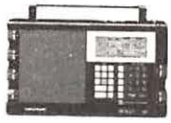

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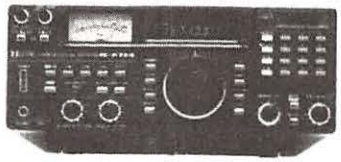

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Shortwave Broadcasting

Glenn Hauser
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Enid, OK 73702

An important anniversary might have passed unnoticed if William O. Dickerman in Williamsport, Pennsylvania, had not spotted a story in the August 28, 1939, issue of *Time*. Until then, U.S. shortwave stations had experimental licenses, and call signs in the amateur style but with an "X" in them. With new calls in the same style as domestic broadcast stations, the shortwavers were at last "commercial" and able to sell time -- though potential advertisers were not exactly breaking their doors down.

In Pittsburgh, for example, the shortwave counterpart of KDKA started in 1921 as 8XK, then 8XS, and later W8XK. Among its services were programs to the Far North in English, French, Icelandic, Danish and Eskimo. Now the FCC had renamed it WPIT. In Cincinnati, W8XAL became WLWO; in Schnectady, W2XAD and W2XAF turned into WGEA and WGEO; in San Francisco, W6XBE metamorphosed into KGEI; Philadelphia's W3XAU was renamed WCAI; and in New York, W3XL and W3XAL were reborn as WNBI and WRCA.

But the first phase of U.S. commercial shortwave broadcasting was not to last long. With the outbreak of World War II, the Voice of America was established, and took over most of these transmitters. They kept their call signs, however, into the early 1960s, and some stations still existing can trace their lineage back to 1939 and beyond. WLWO became VOA in Bethany, Ohio; KGEI resumed private, if not commercial, operation as a religious station.

And, as Dickerman points out, another station not mentioned in the article is a major presence today. WYFR started as W1XAL in Scituate, Massachusetts, then became WRUL, WNYW, relayed the VOA during the Cuban missile crisis, and moved to Florida in 1977.

Now to the shortwave news of today, presented for your convenience and future reference in alphabetical order.

BOLIVIA Everyone hearing the new station on 4600 kHz apparently accepted the original ID given by its discoverer as Radio Perla del Agro, but Gabriel Ivan Barrera in Argentina later revised this to La Perla del Acre. (It's on that river bordering the Brazilian state of the same name.)

And he has another discovery: on 6005.1 kHz, Radio Horizonte, in La Paz, heard for an hour after opening at 0958 UTC. Of course, that frequency used to be occupied by Radio Progreso in the same city. (RCI SWL Digest)

BOTSWANA Filling the vacuum left by Africa Number One's evaporation from 4830, Radio Botswana moved in here, parallel to 3356, noted at 1858-1948, says Roland Schulze in West Germany. (SWLD)

CANADA Contrary to previous plans, RCI's first frequency on the 13 MHz band was 13650, used in various European languages from 1800 to 2130, including English weekdays at 1830. This avoided Baghdad on 13660 and 13680, but clashed with a Spanish spy-numbers station on 13650 at 2100.

RCI's relays of Beijing (0400 UTC on 11840) provoked hot debate in parliament and in the press. Foreign Minister Joe Clark decided to continue them in view of the benefit RCI gets in relays via China, and in the hope that this would deter China from starting to jam Canada's quickly-introduced Chinese broadcasts via Japan.

Meanwhile, RCI's own future is very much in doubt. Massive budget cuts in October at CBC have provoked proposals that RCI be terminated, or at least separated from the CBC. Now, more than ever, RCI needs listeners' letters of support: Box 6000, Montreal, Quebec, H3C 3A8.

CANARY ISLANDS We haven't seen it with our own eyes, but Mick Ogrizek reports that Spanish National Radio's latest schedule again specifies Tenerife as the transmitter site at 2200-2300, this time on 17715 kHz, per Radio Australia's Japanese DX program.

CAPE VERDE Radio RSA, South Africa, would like to be one of the first customers for the new private shortwave relay facility being built here. This would greatly improve its signal into North America and Europe. Radio RSA has also been trying to establish a Middle East relay. (World of Radio)

COLOMBIA The 5068 station reported in July and August *MT*, La Voz de las Canas, now seems to be a pirate, not connected with the mediumwave station on 1500 in Cali; also calls itself "La Reina del Caribe" and timechecks are UTC minus 4, so apparently not even in Colombia -- perhaps Venezuela or Florida. (Henrik Klemetz, Sweden; S. Gomez, Catalunya; Dario Monferini, Italy and other Play-DXers)

La Voz de los Fundadores, Manizales, on 4710.35 kHz at 1013 UTC, says W.J. Parks, and at 0035-0405, sloppy operation finally IDing at 0400; third harmonic of 1570, says Terry Krueger. (DX South Florida via Radio Nuevo Mundo)

Cadena Misionaria Bethesda in Bogota plans to go on 6045 if Radio Melodia will sell the transmitter. (Finn Krone, AWR via WDXC Contact) The Grupo Radial Colombiano network has been sold to another evangelical outfit (via Henrik Klemetz, The Radio News)

Caracol has an external service at 0540 of Colombian news for Colombians abroad, heard on 4755, 4845, 4945, 5075, 5955, 6075, 6150. (Daniel Camporini, Radio Enlace)

COSTA RICA Radio for Peace International is fund-raising to purchase a 40 kilowatt transmitter, which could be on the air by early next year. A new three month membership drive offers the following premiums: for $18, the RFPI newsletter; for $28, that plus a color photo book of Costa Rican parks or a T-shirt with new native design (specify S/M/L); for $40, all three. U.S. address is Box 10869, Eugene, OR 97440.

Meanwhile, RFPI does surprisingly well with much lower power in many parts of the world, at least for those willing to use an external antenna. The August schedule was revised to: weekdays 1500-1700 in Spanish on 7375, 25945; the rest in English: 1700-1900 on the same; 2000-2330 on 25945, 21565; 0030-0400 on 21565, 13660; weekends 1800-2330 on 25945, 21565. Sometimes one transmitter is down and 13660 or 7375 might be used at additional times to those scheduled above.

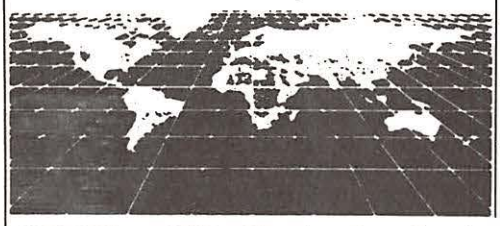
The RFPI mailbag, best source of information about the station, was retimed to: Tuesday 2300, UTC Wednesday 0330, Saturday 2000, following three airings of our "World of Radio," also scheduled Monday 1700, Friday 2000, UTC Saturday 0030, Sunday 2230.

DENMARK/NORWAY Though Norway cleared time, the second halves of hours, for Denmark relays, this now seems unlikely to start before 1990, says a Norwegian radio spokesperson at the European DX Council meeting (Sweden Calling DXers)

DJIBOUTI Radio France Internationale plans to add a relay here for a special African service of four to six hours per day in French, Arabic, English, Portuguese; unknown when. (Radio-Enlace)

ECUADOR HCJB plans to expand from 15 languages now to 60 by 2000. Its transmitter-building facility at Crown International, Elkhart, Indiana, is completing another 100 kilowatt unit, and plans to produce more 100s and 500s for HCJB as well as TWR, FEBC and ELWA.

HCJB has a commitment to avoid editorializing and not to broadcast negative news about Ecuador. The Ecuadorian government requires all its international diplomats to listen to HCJB. (Jim Allen, HCJB on Radio Australia Communicator)



EQUATORIAL GUINEA The American-brokered religious broadcasting from here has been expanded. In addition to Radio Africa on 7189, Radio East Africa operates Saturdays 0500-1500, Sundays 0500-1200 on 9585. (Pan American Broadcasting) Really 9582.5 or 9852.5?

FALKLAND ISLANDS FIBS operates at 0610-1300 and 1630-2130 local time; at other times, BFBS London is aired, on 3958 kHz. Local time is UTC-3 Oct to April, UTC-5 April to Oct. (Daniel Camporini, Argentina, who calls it Malvinas, Play-DX)

GABON On a visit to the station, Alfonso Montealegre and Jaime Baguena learned that Radio Moscow is studying the possibility of relays via Africa Number One, if a satellite link can be set up. (Radio-Enlace) This should allow them to cut down from the 20 frequencies they say are needed to cover America, it's so large.

Poor Radio Moscow is far behind other major stations, lacking a worldwide network of relay bases. The Cape Verde site has also made clear Moscow would be welcome.

GREENLAND Publicity in the local press that 800 unanswered reception reports had piled up on the desk of Henrik Jorgensen of Kalaallit Nunaata Radioa, caused some embarrassment and then the hiring of extra staff to catch up with QSLing. Before then, only those phoning the station and describing their letters, could hope for a reply. However, the only shortwave frequency, 3999, is not effectively serving its intended audience of fishermen, and is to be closed down at year's end. (NASWA)

HAWAII WWVH has resumed a propagation report after a long hiatus, hourly at :45 minutes past on 2.5, 5, 10, and 15 MHz, the same as on WWV at :18.

INDIA All India Radio has been discussing possible relay agreements with Yugoslavia and Vietnam. And previously, with Cuba, Ghana, Malaysia, South Korea, France. But talks had to be scrapped as the Indian government refuses to allow foreign broadcasts to be aired from transmitters in India. The Indian government has sabotaged every bid by AIR to arrange for relay facilities overseas. (Manosij Guha, India, DX Spread)

With the possibility Insat 1-B will fail before Insat 1-D is in orbit, AIR is putting its domestic shortwave feeder net on standby. (Guha, Media Network) The 10-kilowatt transmitter at Leh, Jammu and Kashmir has been installed.

Due to lack of clear channels, there is an increasing trend to accommodate two AIR transmitters distant from each other on the same frequency. Thus, 4760 and 6085 allocated both for Leh and Port Blair, Andaman Islands, for test purposes only. 4760 was unworkable due to Afghanistan and China. (Guha, DX Spread)

INDONESIA RRI Regional I, Surakarta says two of its shortwave frequencies are at one site in the city, the other some distance away. In Surakarta are 4900 with 500 watts at 0030-1000, 1700-2200, and 2400 with one kilowatt at 2200-0030, 0500-0800, 1000-1700. At Cawas, Klaten, 30 km southwest is the 10-kilowatt unit on 4932 at 1100-1700, along with the 50-kilowatt mediumwave on 972. (Ed Kusalik, Coaldale, Alberta)

INTERNATIONAL VACUUM C-SPAN, the satellite TV network covering Congress, planned to debut a two-channel audio service September 5 -- perfect quality reception of "shortwave" stations available to cable systems and TVRO owners. One channel carries BBC World Service nonstop; the other offers six hours each evening from Netherlands, Switzerland, Canada, and perhaps Japan, China, West Germany, Austria. This has already been testing for several months. (via Malcolm Kaufman, MA)

Though music will be most improved, this will only be incidental as C-SPAN is dedicated to talk. (Beth Glatt, C-SPAN manager of the audio service, at ANARCON)

INTERNATIONAL WATERS Voice of Peace, off Israel, was heard at 0130 on 13851 kHz, the ninth harmonic of 1539 kHz (announced as 1540). (Pintu Dhawan, Ludhiana, India, DX Post)

IRELAND Radio Dublin came back on shortwave, despite anti-pirate legislation, heard on 6911.92 at 0112-0130, with 40 watts, pop music and live program. (Dario Monferini, Italy, Play-DX)

ITALY World News and Information Radio began a trial run this summer through the Italian Radio Relay Service,

Sundays at 0900 UTC on 9860 kHz. Due to the expense, and its feasibility having been proved, this broadcast may have been suspended for the time being. National Public Radio has been uncooperative as a program supplier, so some of the material broadcast came from Pacifica. W.N.I.R. invites people to join its public broadcasting movement that will affect the world. A one-year membership is $35, to Box 7565, Gaithersburg, MD 20898.

Italy's vague shortwave laws lead to another unusual outlet: Radio Ashran, in Torino, playing Hindi music, and IDs in English and French, said to be ten watts on 26585.5 kHz, operating Sundays at 0800-1000 and 1400-1600 UTC, heard by M. Romero in Cumina, 14 km away. (Play-DX)

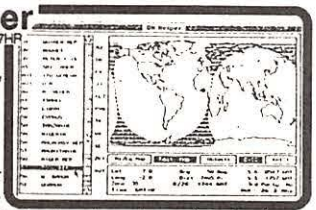
KOREA, NORTH The third harmonic of 4780 has been heard on 14340 kHz at 1300-1347. (Ed LaCrosse, CA, SWL Digest)

KOREA, SOUTH Topics for the Friday show, "Listener's Forum" on Radio Korea: Sept. 1 and 8, traditional holiday foods of different cultures (tied in with Chusok, Full Moon Day, Sept. 14); Sept. 15, 22 and 29, your reminiscences of the Seoul Olympics a year ago. Your comments by letter or cassette tape should go to: Listener's Forum, English Service, Radio Korea, KBS, Seoul, Korea. Or FAX 781-3799. (via Han Hee Joo, ANARCON) Best reception is probably at 1400-1500 on 15575.

MALAYSIA What seems to be the second harmonic of 7295 has been heard from 1540 until closing at 1600 on 14590. (Ed LaCrosse, CA, SWL Digest)

MOZAMBIQUE Radio Maputo sent a schedule in English, valid March 1989 until further notice: 1100-1130 on 11820 or 11835 and 9525; 1800-1900 on 9620, 4855, 3265; both also on 1079 kHz and 98.010 MHz. Weekdays, news, then "Outlook Africa," and in the evening, music. Saturday, news, "Outlook Africa" week in Mozambique, and at 1830 "Just Jazz." Sunday, news, "Sunday Special" on an issue of interest in southern Africa; and at 1830 the best of Mozambican pop music. (via Ed Kusalik, ALta.) Frequencies vary.

NEW ZEALAND Daylight-shifting time has been expanded by five weeks: from the second Sunday in October to the third Sunday in March. The September schedule for Radio New Zealand: 1830-2105, 2345-0145 and 0330-0730 on 15150, 17705; 0900-1205 UTC on 9805, 11780. (Arthur T. Cushen, MBE, Media Network) Presumably also Saturday and Sunday filling the gap at



Shortwave Broadcasting

0145-0330.

PANAMA There's been no shortwave broadcasting from here for 20 years, since the military has vetoed it. Now the Cuban government is making a grant to get two Czech transmitters, one of 100 kilowatts, the other 50, and multi-directional, multi-frequency antennas.

Panama still has rights to some tropical shortwave frequencies, and Noriega's illegitimate government plans to activate two of them. It has been, however, hard to find a suitable shortwave transmitter site for Radio Nacional, so it may be some time before Noriega can propagate his position to the world -- if still in power. So reports a Panamanian engineer at ANARCON. (World of Radio)

PARAGUAY Emisoras Paraguay has been reactivated on 6014.3, good on lower sideband at 1020-1040. (Julian Anderson, Argentina, Onda Corta)

PERU What's the station heard weakly on 5277.58 at 0211-0230? (Chuck Bolland, FL, SWL Digest) It's Radio Grau, Huancabamba, on 5277 replacing 4005, heard at 1030. Also, La Voz de Cutervo on 5661 opened earlier at 1030 instead of 1210. (Geoff Cosier, Radio Australia Communicator) A new station is Emisora Cosmos, Lircay on 4870, heard at 1130 and 2245, scheduled 1000-0430. (Rafael Rojas, Peru, Play-DX and Radio-Enlace)

SAIPAN If you haven't heard KYOI lately, it closed down in July, until late October. (Mrs. Leslie Edwards, PA) No doubt to facilitate installation of a second transmitter and additional antennas to serve Australia.

SEYCHELLES FEBA expected to have its third 100-kilowatt transmitter in regular service this month. It has been testing for a couple of months, replacing an old 25 kW, such as 1500-1625 in English on Saturdays, paralleling 9590 to 11760 and 15325. (Alok Das Gupta, India, Radio Australia Japanese DX Time)

SIERRA LEONE Emmanuel Ehirim, Project Engineer at the Sierra Leone Broadcasting Service in Freetown, is more receptive to friendly, rather than formal reception reports. He studied both in Hungary and the USA, and would welcome a challenging and rewarding job in the States.

A verification letter says SLBS has upgraded shortwave with two new 10 kW Continental transmitters, using a log periodic covering 2 to 25 MHz, on 3316 mornings and late evenings, 5980 daytime and early evening. (Richard A. D'Angelo, PA)

SLBS, 3316, testing between 2145 and 0215 with Afro music, transcriptions from BBC, VOA, Deutsche Welle, noted by many DXers at the DX camp of the Danish SW Club Int'l. (Play-DX)

SRI LANKA Trans World Radio shortwave broadcasts via SLBC have been suspended pending new negotiations; plans to install its own 100 kW at Puttalam, the present 400 kW mediumwave site, with curtain antenna. (Victor Goonetillede, Sri Lanka, Sweden Calling DXers)

Meanwhile, SLBC has increased usage of former TWR facilities for its own broadcasts to India, commercial service in Tamil on 882 at 1115-1315; also 10 kW on 6050 at 1330-1730, 35 kW on 11895 at 1330-1500, switching to 11930 at 1500-1730. (Goonetilleke, Media Network)

UNITED ARAB EMIRATES UAE Radio Dubai appeared on 15555 kHz, formerly used by clandestine Iran's Flag of Freedom Radio, from 0226 in Arabic, 0330 in English, parallel 15435 and 17890. (Ernie Behr, Kenora, Ont., RCI SWL Digest)

UKOGBANI Live broadcasts of classical music are a rarity on shortwave, but BBC still does it with Promenade Concerts several days per week at 1830 UTC; delayed portions are heard better in North America, Sun 1515 and Tues 2315, through mid-September.

A cast packed with American stars of today portrays film stars of the 40s and 50s, on Play of the Week, August 27 at 0030, 1130, and 1830, "Are You Now or Have You Ever Been . . .?" by Eric Bentley, a documentary drama based on Senator McCarthy's hearings investigating communism in Hollywood.

Spike Milligan of the Goon Show talks about himself, and his anarchic work, illustrated with clips, on "Funny That Way," August 30 at 1530, 31 at 0030, 1030 GMT.

UNITED STATES OF AMERICA Our "World of Radio" is now scheduled on WRNO, New Orleans: UTC Thursday 0030 on 7355; Thursday 1430 on 11965; Thursday 2300 on 13720; UTC Saturday 0300 on 6185; Saturday 2330 on 13720; Sunday 2030 on 15420. Sometimes the first two are repeats of the previous week; and times vary -- stay tuned if you don't hear W.O.R. promptly at the scheduled times.

WWCR, Nashville, is applying for a new South American antenna. (George McClintock, WWCR, RCI SWL Digest)

Mother Angelica and her Eternal Word Television Network have been going on satellite and cable for eight years. Now they're expanding to FM, and shortwave, to reach Europe, the Americas, and much of Africa, says the Birmingham News and Post-Herald, but no hint of what shortwave sites may be involved. (via Mike Cooper, World of Radio)

First AFRTS eliminated shortwave broadcasts via VOA: now even the satellite feed is being scrambled after AFRTS urged individuals to spend $6000 on satellite reception systems. Fortunately, the lower sideband feeders, presumably out of England, have continued. More reliable than the frequencies given last month is 16041.3, heard at many hours of the day and night in North America. (via Jim Wishner, Steven R. Lare, Chuck Bolland, and gh)

WTVN, Columbus, OH, has been making it to Europe on 26250 kHz, for example, on a Sunday at 1650-1800 with a remote from a shopping center on "News Radio 6-10 WTVN," say Mark Hattam, England, and Sergio Nuzzi, Italy. (Play-DX) No-data letter from Gary Hartman, CE for US$1 says the transmitter is used to supply an interrupted feedback signal, the station's program interrupted by studio operator to remote locations. (Andree Bollin, Germany, DSWCI SW News) The "low band" of 25870 to 26470 is available to broadcast licensees as auxiliary frequencies. WTVN has received reports from Hawaii, England, Holland, and Greenland, plus many from the West Coast. Address is 42 East Gay Street, Columbus, OH 43215. (Mark Hattam, WDXC Contact)

VATICAN Vatican Radio was heard at 1515 past 1545 to Africa on new 21657.5 kHz, interfering with BBC-Seychelles on 21660. (Richard E. Wood, Hawaii, Sweden Calling DXers) They must have been trying to split the difference between interference on 21650 and 21665, like HCJB once did on 21477.5.

VENEZUELA An undated but presumably current schedule for the seldom-reported external service of Radio Nacional de Venezuela was distributed at ANARCON. It shows one hour Spanish broadcasts at 1100, 1400, 1800, 2100, 2400 and 0300 UTC on 9540; also perhaps 11695, 11850, 5020. However a weekly review in English is the second item on Saturdays, after the news.

Among the six to nine features in Spanish on different days: Sunday: "Folklore, Club de la Amistad." Monday: "Venezolanos para el Mundo -- biografias, Petroleo: Protagonista de Este Siglo." Tuesday: "Onda Latina, Conociendo a Venezuela." Wednesday: "Resena Historica, Noticiario Cultural, Divulgacion Cientifica, Petroleo: Protagonista." Thursday: "Musica Folklorica Latinoamericana, Venezuela y su Geografia." Friday: "Cielo y Canto, Petroleo: Protagonista." Saturday: "Nuestro Insolito Universo, Conociendo a Venezuela, Hecho y Personajes."

Radio Capital, 4850 and La Voz de Carabobo, 4780 have dropped shortwave. Radio Elorza has been assigned 4900, but not yet purchased shortwave equipment. (Jairo Salazar, Radio News)

For more news read DX Listening Digest and /or Review of International Broadcasting. Samples $2 each in North America, 7 IRCs or US$3 each overseas airmail, US funds on a US bank; 10-issue subs in NA US$21 or both for US$40, from Glenn Hauser, Box 1684-MT, Enid, OK 73702.

Also monitor World of Radio each week on RFPI and WRNO; see Costa Rica, USA above. A separate DX news report concludes each SWL Digest on RCI.

Broadcast Loggings

Let other readers know what you're enjoying. Send your loggings to ***Gayle Van Horn****, P.O. Box 1088, Gretna, LA 70053-1088. English broadcast unless otherwise noted.*

0030 UTC on 9835
Hungary: Radio Budapest. National news, discussion of dam systems on the Danube River. Parallel frequencies audible were 11910 and 9520 kHz. (Bob Doyle, Shelton, CT) (Leonard Price, Annandale, VA) *Welcome to MTI-ed.*

0100 UTC on 7345
Czechoslovakia: Radio Prague. News, pop music, and philately program. Excellent signal. (Robert Landau, Secaucus, NJ) Parallel frequencies monitored were 11990 and 9625 kHz. (Leonard Price, Annandale, VA)

0100 UTC on 6020
Netherlands: Radio Netherlands. "Rembrandt Express" interview with Jerry and Dody Cowan who hosted "His and Hers" until 1981. Good signal strength and quality. Better than parallel freqs 6165 and 15315 kHz. (Leonard Price, Annandale, VA)

0200 UTC on 6010
South Africa: Radio RSA. News and weekly show "Footprints in South Africa," followed by "DX Corner." Parallel frequencies audible on 9615 and 9580 kHz. (Bob Doyle, Shelton, CT) Monitored at 1400 UTC on 21535 kHz. (Gunter Wurr, Philadelphia, PA)

0330 UTC on 7135
France: Radio France Int'l. "Cinema Magazine" show to 0340 UTC. Commentary on poster expo on the theme of human rights. (Bob Hurley, Baltimore, MD) (John Carson, Norman, OK)

0359 UTC on 15060
Saudi Arabia: Broadcasting Service of the Kingdom. (BSKSA) Turkish. Oriental lute interval signal, followed by national anthem at 0400 UTC. Sign-on and Holy Koran recitations until 0412 UTC. (Jerry Witham, Keaau, HI)

0359 UTC on 4820
Botswana: Radio Botswana. Setswana/English. Clear interval signal under La Voz Evangelica (which signed off at 0400 UTC). Poor signal quality with strong interference. (Robert Landau, Secaucus, NJ)

0422 UTC on 4965
Namibia: Radio Southwest Africa. German. American gospel music and native African tunes. ID at 0430 UTC. (Guy Atkins, Issaquah, WA) (Bob Hurley, Baltimore, MD)

0445 UTC on 5015
Clandestine: Radio Truth. Regional African news from male/female announcer duo. Station ID and sign-off at 0502 UTC, with bird-call interval signal. (Jerry Witham, Keaau, HI)

0450 UTC on 6135
Society Islands: RFO-Tahiti. French/Tahitian. Polynesian music and lively telephone conversations with local listeners. Co-channel interference. (Jerry Witham, Keaau, HI)

0452 UTC on 7255
Nigeria: Voice of Nigeria. Interval signal of native drums and upcoming program schedule. "African Music" program followed by national news. (John Carson, Norman, OK) (Leonard Price, Annandale, VA)

0533 UTC on 4815
Burkina Faso. RTV Burkina. Native vernaculars/French. African music and news at the hour. Four-minute break at 0542 UTC. Poor signal with strong static. (Robert Landau, Secaucus, NJ) Monitored also from 2345-0001 sign-off with ID and anthem. (Bob Doyle, Shelton, CT)

0603 UTC on 14917.7 USB
Kiribati: Radio Kiribati. News relay from Radio Australia rather than usual BBC. Very weak signal. (Guy Atkins, Issaquah, WA)

0725 UTC on 5020
Solomon Islands: Solomon Islands Broadcasting Corp. (SIBC). Weather and tide information. ID break, commercials. National sports to rapid fade-out. (Rod Pearson, St. Augustine, FL) (Jerry Witham, Keaau, HI)

0732 UTC on 6185
Mexico: Radio Educacion. Spanish. Station ID at tune-in, followed by classical piano music program. Weak signal and moderate interference. (Robert Landau, Baltimore, MD)

0745 UTC on 3945
Vanuatu: Radio Vanuatu. Bislama. Interview with heavy interference. Station ID and news at 0800 UTC. (Jerry Witham, Keaau, HI)

0826 UTC on 6006
Costa Rica: Radio Reloj. Spanish. ID as "Radio Reloj, numero uno Costa Rica." Fair reception. (Jack Moore, Clementon, NJ)

0850 UTC on 4890
Papua New Guinea: Papua Territory, NBC. Pidgin. Time-tips with drum and conch shell signal at 0900 UTC. National and regional news. Poor to fair signal. (Guy Atkins, Issaquah, WA)

0920 UTC on 11760
Cook Islands: Radio Cook Islands. Maori. (tentative) Pacific Island music with presumed news bits. Fair signal. (Guy Atkins, Issaquah, WA)

1053 UTC on 15360
Singapore: BBC relay. Two radio dramas. International news in-depth with editorials. Fairly strong signal. (Donald Myra, Brooklyn, NY)

1107 UTC on 15400
Finland: Radio Finland. Occasional co-channel interference from BBC Ascension Islands. (Donald Myra, Brooklyn, NY) Audible at 0130 UTC on 15185 kHz. (Leonard Price, Annandale, VA)

1112 UTC on 15295
Malaysia: Voice of Malaysia. Chinese. Popular American southern tunes. News coverage with fair signal to 1115 UTC. (Donald Myra, Brooklyn, NY) (Nick Terrence, Huntington, NY)

1150 UTC on 3315
Papua New Guinea: Admiralty Islands, Radio Manus. Pidgin. "Rock N' Roll" program. Time check for "5 till 9 O'clock" and quick ID with city location. Local news and pop music tunes. (Guy Atkins, Issaquah, WA)

1230 UTC on 15330
Madagascar: Radio Netherlands. Indonesian. Classical and operatic music program. Passport schedule reports language as Chinese, however, station schedule reports as Indonesian. (Bob Fraser, Cohasset, MA)

1300 UTC on 3985
Indonesia: Irian Jaya, Radio Republik Indonesia-Manokwari. Indonesian. Jakarta news relay at tune-in, followed by ID. Fair signal with fading. (Rod Pearson, St. Augustine, FL)

1300 UTC on 9625
Canada: CBC Northern Quebec Service. News of Quebec and "Morningside" program. Also monitored on parallel 11720 kHz. (Bob Hurley, Baltimore, MD)

1340 UTC on 6325
Clandestine: Voice of the Khmer. Unknown. (tentative). Easy-listening pop style music. Announcements at 1355 UTC with mentions of Kampuchea. Sign-off at 1400 UTC with an unidentified anthem. Fair signal quality. (Guy Atkins, Issaquah, WA)

1419 UTC on 21705
Norway: Radio Norway Int'l. Church service, station ID at 1428 UTC, followed by march music to sign-off at 1443. (John Carson, Norman, OK)

1421 UTC on 15575
South Korea: Radio Korea. Korean religious holidays, Korean language lessons and discussion about Korean youth problems. (John Carson, Norman, OK)

1540 UTC on 17810
Sweden: Radio Sweden. Heard also on parallel frequency 16910 kHz. (Bob Hurley, Baltimore, MD) Monitored on 21610 kHz at 1402 UTC. (John Carson, Norman, OK)

1545 UTC on 13695
USA: WYFR. "Christian Home" program with discussion on native tribes in Brazil. Also monitored on 14255/14300 and 15160 kHz. (Bob Hurley, Baltimore, MD)

1611 UTC on 15220
Philippines: Radio Veritas. Urdu. Nice sub-continent music, beamed to southeast Asia. Station ID at 1614 UTC. Unidentified language at 1615 UTC. Good signal. (Guy Atkins, Issaquah, WA)

1710 UTC on 17830
Switzerland: Red Cross Broadcasting Service. French/English. News of the ICRC activities until 1715 UTC, repeated in English until sign-off. Strong signal with minimal interference. (Robert Landau, Secaucus, NJ) Audible on 12035 kHz at 0220 UTC. (Bob Hurley, Baltimore, MD)

1915 UTC on 15640
Israel: Kol Israel. "Calling All Listeners" show which included a comment that old letters and reception reports are put through a paper recycler! (Bob Fraser, Cohasset, MA)

1935 UTC on 15769.9 USB
Iceland: Iceland State Broadcasting Service. Icelandic. Station sign-on with announcer chat. ID repeated as "Utvarp Reykjavik" for sign-off at 2010 UTC. Frequency varied from 15769.9-15766.9 USB. (Stephen Price, Conemaugh, PA)

2052 UTC on 17735
Oman: Radio Oman. Arabic. (tentative) News at the hour, followed by dramatic readings. Excellent signal strength; anthem at 2130 UTC. (Robert Landau, Baltimore, MD)

2235 UTC on 7205
Cyprus: Cyprus Broadcasting Corp. Greek. Folk songs and music until ID and sign-off at 2244 UTC. Strong and clear. (Robert Landau, Baltimore, MD)

2235 UTC on 4835
Mali: RTV Malienne. French. Lively DJ presents a mix of U.S. and French soul/rhythm and blues. (Bob Doyle, Shelton, CT)

2345 UTC on 9925
Belgium: BRT. North-South program with commentary on Chinese residents in Belgium. (Bob Fraser, Cohasset, MA)

Utility World

Larry Van Horn
P.O. Box 1088
Gretna, LA 70053-1088

Verifying the Utilities

Most dyed-in-the-wool shortwave broadcast and ute QSLers know about the joys and frustrations of QSLing (or verifying) a station. Therefore, I am going to address this discussion to the newcomers in our ranks. You old timers stick around though, there might be a tip or two for you.

Okay, first, just what is a QSL?

Well, that's the easy part. Once you hear a station, you record some basic information about the communication. You then put that information into letter form and mail it to the station in question. If the QSL gods are looking on you favorably that month and the mail service and the ute station will it, you could be blessed with a return card or letter from the station confirming your reception.

Utility stations play the QSL game by a different set of rules than broadcast stations. In fact, if you apply what you learned about QSLING shortwave broadcast stations to utility QSLING, your results will be disappointing.

The big difference between shortwave broadcast and utility stations is that all utility station transmissions are considered private communications. FCC and ITU regulations expressly forbid any divulgence of specific details relating to these communications.

That means you cannot repeat any part of the communication exchange you monitored -- even to the station that was one of the involved parties. If you violate these regulations by sending detailed reports to the stations of conversations you have monitored, the feds won't knock your door down. You just won't receive a QSL in the mail.

"If I can't write down any details of the communication I monitored, how can I prove that I heard the station?" The way you get around this dilemma is to talk about the nature of the communications instead of the details. Let me explain how this is done by giving you a hypothetical example.

Station ABC calls up station XYZ for a communications check. They exchange 5 by 5 reports ("loud and clear").

Station ABC then has XYZ run a phone patch for Larry to his wife Gayle in New Orleans. They both discuss their plans once he gets off the cruise. After some romantic chit-chat, the phone patch is terminated. After that, Larry then calls his parents to confirm their visit following the cruise. More chit-chat is exchanged, then that phone patch is terminated. The operator at ABC then shoots the breeze with the operator of XYZ, then signs off the air.

Now if you wanted to get a QSL from station ABC, your report should be written using a time line approach.

0300-0305: Station ABC established communications with Station XYZ
0305-0315: Station ABC ran phone patch via Station XYZ
0320-0325: Station ABC ran phone patch via Station XYZ
0325-0345: Station ABC working Station XYZ
0400: Station ABC signed off.

In addition to the above information, you should also provide in your report some basic data essential to any good reception report. This would include: date, time (express in UTC standards), frequency (as accurately as you can get it, if approximate, state so), transmission mode (upper sideband, etc), language, gender, information on your radio equipment, etc.

In essence, using time lines, you have now provided the station with reference information they can use to verify your reception report against their logbooks to confirm the intercept. The report did not, however, violate the privacy or confidentiality of the transmissions. If you use this approach in your reception reports, your chances of getting a QSL from the station are vastly improved.

But there's bad news, too. Even if you follow these guidelines, there's no guarantee you'll score. Keep in mind is that these stations usually have a limited staff and budget.

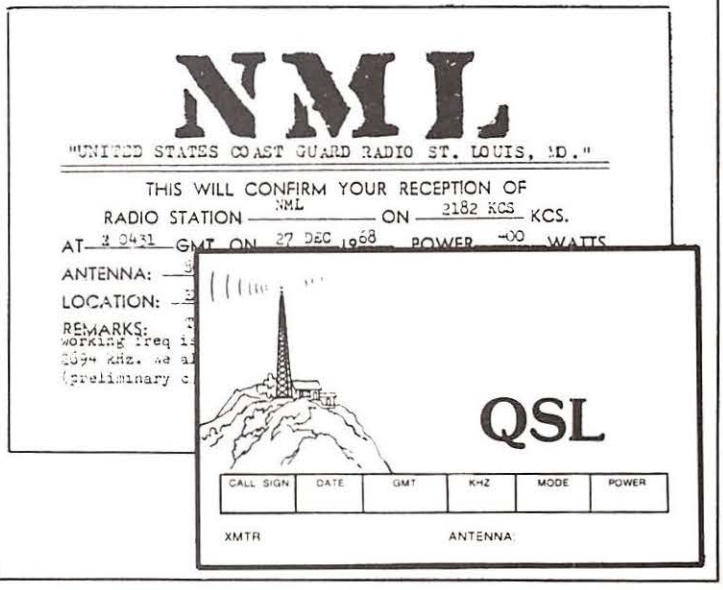
One way to improve your chance of receiving a verification is to include what ute listeners call a PFC (prepared form card) with your reception report. Remember, utility stations are under no obligation to verify any report. Also, the station might not have letterhead or printed QSL cards. The PFC will make it easier for the station to reply.

PFCs are normally prepared by the DXer. You can roll your own or have them done at a print shop. The design is strictly up to you but the PFC will be your QSL sent by that station so it should contain the same information that you would want to see on a QSL from the station.

A good treatment on the subject of utility QSLs and PFCs can be found in the following publications: *Shortwave Radio Listening with the Experts* by Gerry Dexter, and *Utility QSL Address Guide, Volume 1 and 2* by Daryll Symington and John Henault.

The latter two volume set is an absolute must for the Utility QSLer. In addition to a detailed treatment on utility QSLING, the *Utility QSL Address Guide* has the most comprehensive address list of utility stations that I know of. You can get both editions from DX Radio Supply for 25.90 plus 2.50 UPS. Their address is Box 360, Wagontown, PA 19376.

Some utility stations have printed QSL cards, but enclosing a PFC should improve your chances of a return.



Another book that lists utility station QSL addresses is the Klingenfuss *Guide to Utility Stations* discussed in last month's column.

One final reference for current QSL information is *MT*'s own QSL Report column by Gayle Van Horn. Each month listeners report their QSL catches to Gayle's column. It is a good place to not only report your findings, but also check what other utility listeners are verifying.

From the Ute World Mailbag

Monitoring Russian ship traffic is one interesting aspect of Utility World listening. Sven Westlund in Sweden passes along the following information on monitoring Russian weather ships located at Ocean Charlie.

These weather ships are located at position 52.7 degrees north and 35.5 degrees west. This position was set up by the USSR. The actual ship in charge located at that position uses the call sign C7C.

One ship will stay on station Charlie for about five weeks and is then replaced by another ship. The transmission schedule varies from time to time, but Table 1 reflects the schedule that was used from May 5-June 6, 1988. The Georgi Ushakov (ERET) was on station Charlie at the time.

Table 1
Station Charlie Transmission Schedule
May 5-June 6, 1988

Time UTC	Frequency (kHz)
0505	6315
1005	12607
1640	12522.5, 16703.5
1705	12607, 16707
1905	12469.5, 16602.4
2205	6315

Sven says the actual schedule for station Charlie can be obtained by monitoring the NAWIP transmissions transmitted by such stations as NAM in Norfolk, Virginia.

One additional note on monitoring Russian ships -- Sven says that the master station in the USSR for traffic to the NISP ships is the coastal station RNO in Moscow. It can be heard on 12793 and 17163 kHz. The corresponding CW/RTTY ship calling frequencies are 12570 and 16715 kHz. Thanks, Sven, for the update.

One of our listeners, Dave White, disagrees with Joerg Klingenfuss's analysis that the single letter CW beacons (i.e.- U/K, etc.) originate in Russia. Dave says that he has been following the U/K beacons on many frequencies for years, ever since 1982.

Dave said, "I have heard this before, that they were located in the Soviet Union, but I believe that this is disinformation."

He has checked carefully with signals and conditions from that area, and there is no way that they could originate from the USSR according to Mr. White. Dave asks if anyone has heard these series of beacons when they were active with traffic? They were busy up until late 1986. When traffic was sent, it was repeated from two to as many as seven times.

The following list reflects frequencies that have not been listed in the latest Klingenfuss *Guide to Utility Stations*, according to Mr. White.

'U' beacon - 6984, 12327 (under OVG 5), 14967 kHz

'K' beacon - 12150 kHz

A scan of my Ute World database shows the following single letter CW beacon frequencies recently reported by our listeners:

'S' beacon - 7422.7, 17016.6 kHz
'K' beacon - 7905.5, 8158.4, 8670.0, 14477.2 kHz
'U' beacon - 7677.5, 8137.1, 8670.5, 15655.4 kHz
'D' beacon - 8645.5 kHz
'P' beacon - 13636.2 kHz

I will agree with Mr. White that these stations create lots of questions and no answers. A mystery for years. If it were legit and above board, we'd know what it was, but . . . ? Thanks for the info, Dave; comment Joerg?

Jack Smith in Florida thinks he has solved Bob Grove's mystery log in the May issue of *MT*. To refresh your memory, Bob heard FOB13 calling A523 and told him to shift to 4929 kHz for real world comms on 8153.0 kHz. Jack says it is probably an Army Special Forces exercise that Bob heard. FOB means Forward Operational Base and A523 could be Det 523 Special Forces Group.

Jack says that he spent some time in Special Forces. Interestingly enough, they used CW and one time pads. They used AN/GRC-109 radios until they got new ones that could transmit both CW and voice. Jack says for practice and administrative control of training off Fort Bragg, NC, they always had a 24-hour radio watch at Group Headquarters. Thanks, Jack, and I am sure that Bob and our readers appreciate the information.

Speaking of Bob, he has come across a couple of interesting intercepts that he would like some help on. The first could be a very interesting U.S. Navy medical net that appears to be up 24 hours during exercises and hostile actions. The net is called three times a day: 0800, 1400, 2000 UTC; and the check-ins use typical Navy alpha-numeric call signs.

Bob also monitored on 9292 kHz USB around 2155 UTC with what appeared to be a quasi-military operation. The stations were using call signs like Victor-Delta-Delta. He assumes that the stations were in Canada as they were discussing the outcome of a Calgary hockey game. The operator mentioned that they had been on the air for ten hours and wanted to take a break to eat. Thanks, Bob, and I hope some of our readers can help with these logs.

Finally, Bobby Krey in Austin, Texas, thinks he might have stumbled on a transmission from one of the Navy's TACAMO command aircraft. These aircraft drop about a mile of wire behind them as they fly a communicate with our submarines. Bobby says that in the midst of what sounded like a musical medley of several different pitches in the region of 27 to 30 kHz, he copied the following CW transmission: "Four November Seven Six July Echo Charlie Six Foxtrot Quebec DA AR."

While there appeared to be some sort of frequency shift taking place, he was able to copy the transmission while sitting on one frequency.

He also monitored an extended CW transmission on 22 kHz around 2245 UTC. Navy station NSS-9 was working N3K sending five letter code groups. Bobby says he believes that NSS in Washington, DC, is the only big Navy VLF station still using Morse Code on occasion. Thanks for the report, Bobby, and let's now check in with the rest of this month's contributors to find out what is happening in the Utility World.

Utility World

Utility Loggings

Abbreviations used in this column

All times UTC, frequencies in kilohertz. All voice transmissions are English unless otherwise noted.

AM	Amplitude modulation	ISB	Independent sideband
ARQ	SITOR	LSB	Lower sideband
CW	Morse code	RTTY	Radioteletype
FAX	Facsimile	UNID	Unidentified
FEC	Forward error correction	USB	Upper sideband
ID	Identification		

2670.0 NMN 37-USCG RAdio Ft. Macon, North Carolina, heard at 0100 in USB with a weather broadcast. (Bob Doyle, Shelton, CT)

2813.6 GYA1-Royal Naval Radio Ondon, England, with a 120/576 FAX signal at 0315. European weather map also seen parallel on 3436.6, 4247.6, 6436.6, and 8494.6. (Sundstrom, NJ)

3436.6 GZZ6-Royal Naval Radio London, England, heard with a 120/576 FAX signal at 0315. European weather also seen parallel on 2813.6, 4247.6, 6436.6, and 8494.6. (Sundstrom, NJ)

4213.5 FUF-French Naval Radio Fort de France, Martinique, with a V CW marker at 0450. (Leonard Szalony, Fontana, CA)

4247.6 GZZ2-Royal Naval Radio London, England, at 0315 with a 120/576 FAX signal sending a weather map of Europe. Signal parallel to 2813.6, 3436.6, 6436.6, and 8494.6. (Sundstrom, NJ)

4577.0 AFF2GA (US Air Force MARS station) net control for the weekly region 2 MARS net heard closing the net at 2345 in USB. (Joe Doakes, J Klingenfuss Drive, Mars, PA) *Welcome, Joe.-ed.*

4675.0 TWA flight 894 (PJCK SELCAL) reporting ETA, fuel and frequency change to ATC Shanwick aero. (Robert Confino, Douglassville, PA)

4739.0 RAF UKADGE channel "QV" -- Heard 6JL working C2Y at 0108 in USB with authentications. (Doyle, CT)

4996.0 RWM-Standard Time and Frequency Station Moscow, USSR, with CW ID on time pips heard at 0010. (Doyle, CT)

5100.0 AXM32-Canberra Meteo, Australia, seen at 1145 sending a 120/576 FAX weather map. Very poor and noted parallel on 11030 and 13920. (Sundstrom-NJ)

5690.0 DHM 95-Royal Canadian Air Force Station, Lahr, West Germany, heard at 2318 with weather observations in USB. (Doyle, CT)

5710.5 "LETTERS station"?!?! Male with heavy Spanish accent reciting letters of the international alphabet in groups of five in English; ended with a short sentence in Spanish. (What is this?) (Confino-PA)

6436.6 GYD3-Royal Naval Radio, London, England, sending a 120/576 European FAX weather map at 0315. Signal parallel on several frequencies. (Sundstrom, NJ)

6504.6 WCC-Chatham Radio, Massachusetts, in CW at 1400 with just WCC ID. (Hank Lukas, Plainview, NY) *Welcome aboard, Hank. Wierd frequency for this mode on WCC-ed.*

6535.0 My wierdo of the month log. I just caught the end of an aircraft WORLDWAY working what I think was Toronto. After about 10 to 15 seconds pause, a male operator with a heavy accent asks WORLDWAY what his call sign is. WORLDWAY replies WC643 and asks the station to ID himself. Station says he is TAL (Tango, Alpha, Lima). WORLDWAY asks where he is located. TAL's reply sounds like Somalia. There is a pause at this point and then TAL calls WORLDWAY two more times and gets no reply. In USB at 0700. Any ideas??? (K.R. McKenzie, BC) *The Worldways station I believe is in Toronto (LDOC) and the TAL station is probably SAL Island in the Cape Verde Islands.-ed.*

6698.0 MKL-Pitreavia RAF, England, heard at 2330 in CW with the following message: "VVV DE MKL C2V C2V C2V 3MA 3MA 3MA DE MKL VPGR 23 =" message followed with three letter and figure groups. (Dix, NY)

6840.0 English female 3/2 digit number station heard at 2338. (JC-VA) *Welcome to the column, JC.-ed.*

6875.0 English numbers station with female reciting 3/2 groups at 2215 (hetrodyning with tone too). (Confino, PA)

7552.1 WNHK760-Bell Telephone, Staunton, in USB at 1900 as net control of frequency. Others heard included WNHK761/961/965. (Sundstrom, NJ)

8347.9 UTUN-Soviet cargo ship Akademik Iosif Orbeli with traffic for CLJ Havana Radio at 0326. RTTY 170/50. (Ricks, PA)

8382.2 4XIS-Israeli container ship Zim California, and 4XI?, Zim Genova, with a position report for UNID coastal station in CW at 0319. Was in North Pacific, west of San Francisco. (Ricks, PA)

8401.0 UIAW-Soviet stern trawler factory ship Mikhail Kvashnikov with position and weather for "Agencia Maritima" station COR Havana, Cuba, in CW at 0404. Ship's pendant number is MB-006. Was approaching Panama Canal from Pacific side. COR is a meterorlogical station (I think). (Ricks, PA) *I think too.-ed.*

8418.0 Spanish female four-number group number station at 0301. (Confino-PA)

8494.6 GZZ40-Royal Naval Radio London, England, heard at 0315 sending FAX 120/576 European weather maps. Signal parallel on several frequencies. (Sundstrom, NJ)

8496.0 CLA-Havana Radio informing YHPP Indonesian freighter that all vessels planning to dock in Havana Harbor must present upon arrival: three copies of personal effects declaration, one copy of provision list, five copies of foreign currency declaration, two copies drug and narcotics declaration, and several copies of several other forms. The transmissions of both CLA and YHPP were in English using CW at 0120. (Doakes, PA)

8500.0 Unidentified station "1H" calling "S6" in CW at 1224. (Dix, NY)

8675.0 UDE-Kholmsk Radio, USSR with a CQ CW marker at 1100. (Dix, NY)

8680.2 WSC-Tuckerton Radio, New Jersey, in CW at 1451 with CQ CW marker. (Lucas, NY)

8822.0 Rockwell Flight Service working Saudi 003 in USB at 0813. Started out on 8822, then switched here, then back to 8822. (Larry Riffle, Key West, FL)

8851.0 ATC Salvador Radio working Lufthansa 4321 in USB at 0152. Secondary frequency of 3452.0 kHz. (McKenzie, BC)

8867.0 ATC Sydney Radio working Quantas 34 with a position report and ETA in USB at 0647. Also monitored ATC Auckland at 0632 working United 812. (McKenzie, BC)

8879.0 ATC Mauritius Radio working 2 UNID aircraft at 1508 in USB. ATC Cocos Island Radio heard working Singapore 46 with a position report at 1625. (McKenzie, BC)

8900.0 Unidentified station heard in CW calling BFK??? calling "BFK QRU BFK" at 1633. (McKenzie, BC) *Well, looks by the time of day and the call sign to be a Chinese station to me.-ed.*

8903.0 ATC Manila Radio, Phillipines, working Singapore 81 at 1413 in USB. (McKenzie, BC) ATC Bangui, Central African Republic working Aeroflot 173 and 435 at 0112 in USB with position reports. (Doyle, CT)

8918.0 ATC Tehran, Iran, called by Speedbird 11, couldn't hear Tehran at 0135 in USB. (Doyle, CT)

8924.0 LDOC Amsterdam Radio, Holland, working KLM 802 at 0126 in USB. KLM flight passed ETA to Amsterdam. (Doyle, CT)

8942.0 ATC Ho-Chi-Minh Radio, Vietnam, working Lufthansa 737 at 1425. Also heard Vientianne Radio at 1435 working JAL 727 and Canadian 7. ATC Bangkok Radio was heard at 1556 working N611CL. All stations in USB. (McKenzie, BC)

9006.0 DHN 95-Royal Canadian Air Force station Lahr, West Germany, with weather observations in USB at 0528. (McKenzie, BC)

9032.0 RAF channel "DW" heard weather ops being passed at 0130 in USB by an unknown station. (Doyle, CT)

9180.0 Spanish numbers station with female receiting five-digit groups of numbers at 0253. Female, repeating four-digit numbers in Spanish on 9180 (weak modulation) and 6840 (strong modulation); signals were parallel for a few minutes then 6840 stopped. Someone having an audio panel mis-patched problem? (Confino-PA) *Looks like it, Robert. I find that having both four and five-digit numbers on the same channel is very interesting.-ed.*

10000.0 WWVH-Kaui, Hawaii, in AM at 1230 coming in loud and clear, first time heard on this frequency. (Lucas, NY)

10046.0 4XZ-Israeli Naval Radio Haifa sending a V CW marker at 1550. (McKenzie, BC)

10072.0 Speedking (British Airways London LDOC) working Speedbird 232 in USB at 0112. SELCAL used was BOEM. (McKenzie, BC)

11342.0 ATC New York, New York, working Key 89917 at 1348 with a phone patch to Key dispatch then changed to 6640.0. (Doyle, CT)

11396.0 Heard several station of the SEA ICAO HF network including Bali, Perth, Ujang Pandang, Jakarta, and Darwin working various aircraft in USB between 1507-1624 UTC. (McKenzie, BC)

11291.0 ATC Dakar, Senegal, working Aeroflot 414 at 2255 in USB. Position report passed by aircraft. (Doyle, CT)

11300.0 PK292 reporting flight info to ATC Nairobi, Kenya, on this ICAO HF AF3 channel at 0109 in USB. (Dix, NY)

11920.0 AXM34-Canberra Meteo, Australia, heard at 1145 sending a FAX weather map using 120/576. Signal parallel to 5100 and 13920. (Sundstrom, NJ)

12501.9 UYDP-Soviet stern trawler Moonzund with traffic for Tallinn via ROT Moscow Naval Radio at 0313. RTTY 170/50. (Ricks, PA)

12515.9 EREB-Soviet hydromet weathership Volna with coded weather reports for Vladivostok weather station at 0140. Just south of Clipperton Island in North Pacific off Mexico. RTTY 170/50. (Ricks, PA)

12521.4 UYGV-Soviet reefer Shkval with position report for URL Sevastopol Radio at 0315. Was off Liberia. RTTY 170/50. (Ricks, PA)

12521.9 UZYY-Soviet spaceflight tracking ship Kosmonaut Viktor Patsayev off Togo with tracking tables of upcoming MIR orbits for UUYG, Morzhovets, apparently docked at Montevideo at 0315. RTTY 170/50. (Ricks, PA)

12522.4 UFPS-Soviet fish carrier Pioneer Murmana with traffic for UQA-4 Kiev Radio at 0219. Was off Newfoundland. RTTY 170/50. (Ricks, PA)

12524.4 UZDP-Soviet RO/RO container ship Akademik Kuprevich with traffic for UFB Odessa Radio. Was off Gibraltar enroute to Havana. RTTY 170/50. (Ricks, PA)

12689.0 PPJ-Juncao Radio, Brazil, in CW at 0205 with a V marker. (Lucas, NY)

12690.1 FUX-French Naval Radio LePort, Reunion in CW at 0224 with a V marker. (Lucas, NY)

12695.5 CNP-Casablanca Radio, Morocco, sending CQ CW marker at 1033. (Dix, NY)

12704.5 PKD-Surabaya Radio, Indonesia, heard at 1111 in CW with a CQ marker. (Dix, NY)

12727.0 HLJ-Seoul Radio, South Korea with a CQ CW marker at 1216. (Dix, NY)

12728.0 L2B/C-Buenos Aires Naval Radio heard sending a series of CW navigational warnings at 0015. (Dix, NY)

12741.0 HWN-French Naval Radio Paris, France, at 0321 in CW sending a V marker. New freq? (Sundstrom, NJ) *Yes, according to my list.-ed.*

12843.0 UGE2-Bellingshausen Soviet Base station in South Shetland Islands calling UMFW at 2356 in CW. Said to QSY to 16707. At 2358 calling CQ then changed frequency to 12635. (Dix, NY) *Super nice catch, Jack, the best of the month.-ed.*

12857.7 6WW-Dakar Radio, Senegal, in CW at 0138 with a CW V marker. (Lucas, NY)

12860.0 4XO-Haifa Radio, Israel, in CW at 0120 with CQ CW marker. (Lucas, NY)

12876.0 VAI-Vancouver Coast Guard Radio, British Columbia, in CW at 0511 with a CQ marker. (Lucas, NY)

12895.0 9KK-Kuwait Radio, Kuwait heard at 1257 sending a CQ CW marker. (Dix, NY)

13133.2 USCG Cutter Eagle working CG COMSTA Miami at 1247 in USB. (Doyle, CT)

13291.0 ATC Gander Radio working American 37 in USB at 1810. Aircraft sending a position report. (Doyle, CT)

13354.0 ATC Honolulu Radio working Navy PX704 in USB at 0322. (McKenzie, BC)

13385.0 KKN39-Department of State Radio, Warrenton/Remington, Virginia, sending a QRA CW marker at 0010. (Doakes, PA)

13673.0 6VY41-Dakar Meteo, Senegal, heard at 0335 in RTTY (425/50/N) sending coded weather. At 0340 started calling CQ DE 6VY41/73/79. (Sundstrom, NJ)

13828.0 ZSD-Durban Radio, South Africa, monitored at 1319 in CW with a CQ marker. (Dix, NY) *You sure this one on this channel and not 12828.0?-ed.*

13998.0 FTN99-French Diplo station Paris, France, using 425/50N RTTY at 1715. Station had a good signal with French news. (Sundstrom, NJ)

14024.0 MFA Moscow, USSR, still noted here in the twenty meter ham radio band despite protest. Station heard at 1720 using RTTY 250/100? (Sundstrom, NJ)

16323.0 OVC-Danish Marine station Groennedal, Greenland, heard at 1302 in CW with a V marker. (Sundstrom, NJ)

16702.4 UPUI-Soviet hydromet weathership Professor Vize, with coded weather reports for RNO Artic/Antarctic Meteo station, Moscow, at 1431. Just north of Canary Islands in North Atlantic. RTTY 170/50. (Ricks, PA)

16906.0 YIR-Basrah Radio, Iraq, with DE CW marker at 1954. (Dix, NY)

16913.0 UKA-Vladivostok Radio, USSR, heard at 0500 with a CW CQ marker. (Dix, NY)

16951.0 6VA-Dakar Radio, Senegal, with a CW CQ marker at 1216. (Dix, NY)

16978.4 3BM-Mauritius Radio heard at 0148 sending the following CW message: "VVV CQ DE 3BM 3/5/6. THIS IS MAURITIUS RADIO TRANSMITTING WEATHER ON 6.3511/12.988/16.978 MHZ AND AT 0130/0430/0900/1630 UT AND WITH SUPPLEMENTARY AT 1330 AND 2030 UT DURING CYCLONIC PERIOD PSE STANDBY AS." Warning of a tropical cyclone follwed. (Dix, NY)

17025.0 UPE-Providenia Bukhta Radio, USSR, heard at 0037 in CW with a CQ marker then shifted frequency to 16710. (Dix, NY)

17069.5 JJC-Toyko Radio, Japan, sending 120/576 FAX text in Japanese at 0115. 350 Hz high. (Sundstrom) *Actually, Tom, it looks like they are climbing up now towards their listed frequency. I show them 100 Hz low.-ed.*

17110.0 UFL-Vladisvostok Radio, USSR, sending CW traffic at 0218. (Dix, NY)

17127.2 ZLP-Wairoua Naval Radio, New Zealand, heard at 2012 with a V CW marker. (Dix, NY)

17160.0 PWZ33-Brazilian Naval Radio, Rio de Janeiro, sending navigation warnings via CW then into their V marker at 0210. (Sundstrom, NJ)

17208.5 SVT6-Athens Radio, Greece, at 0235 with DE CW marker. (Sundstrom, NJ)

17209.0 PPR-Rio de Janeiro Radio, Brazil, heard at 0239 with CW call sign ID and ARQ idler. (Sundstrom, NJ)

17217.5 PCH65-Scheveningen Radio, Holland, sending a CW call sign only ID and ARQ idler. (Sundstrom, NJ)

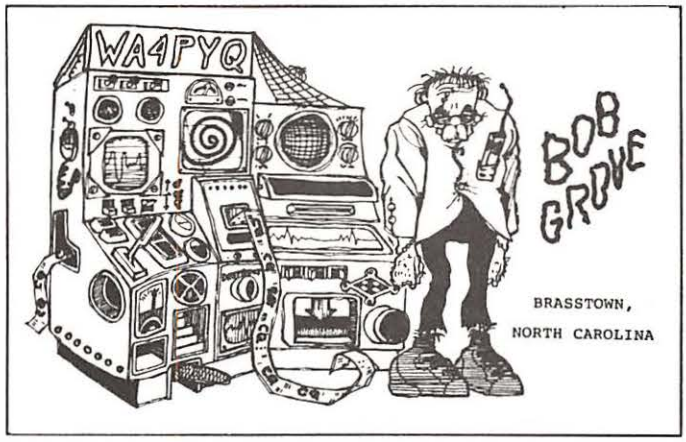
17995.0 Edmonton Military working 6649 at 2222 in USB. Aircraft flight plan to Hickam AFB, Hawaii, mentioned alternate frequencies 18021, 18012, and 21985. (Doyle, CT)

20128.0 Unidentified CW station sending very slow CW at 2335 with repeats of the following: "VE 64 E 4A6 UUN." Sign-off at 2340. (Doyle, CT) *Nothing in my database or list, Bob.-ed.*

20191.0 Space shuttle Discovery heard through Ascension Island station in LSB at 2353. Astronauts talking about IMAX camera film shots and chicken egg experiment. (John Kokinda, Marblehead, CA) *Welcome to Utility World, John, please report often.-ed.*

21964.0 ATC Honolulu, Hawaii, working Singapore 02 and United 819 at 2306 in USB. (Doyle, CT)

22583.2 A9M-Hamala Radio, Bahrein, in CW with a "TLX" at 1942. (Doyle, CT)



Ham QSL cards go into the utility category; though I'm not too sure where this one fits!

The Scanning Report

Bob Kay
P.O. Box 98
Brasstown, NC 28904

Monitoring the media

After the bomb had been dropped, the fire started. Fanned by a warm summer breeze, the flames spread rapidly through an entire city block of row homes.

On the ground, police and firemen arriving on the scene were greeted by bursts of automatic gunfire. Unable to fight the blaze for fear of being shot, the firemen could only watch as the fire continued to consume the private homes.

By nightfall the situation had become an uncontrollable inferno that was being broadcasted "live" across every major television station in Philadelphia. Viewers watched in disbelief as the sounds of crackling flames, emergency vehicle sirens, and screams of terror filled their living rooms.

It was May 13, 1985. In an attempt to evict several members of a radical group called MOVE, the city had bombed and burned the entire block of Osage Avenue. Within twenty-four hours, the event would receive world-wide attention.

Naturally, the scanning action was unbelievable. I had five scanner radios and three tape recorders playing all night. I was also fairly confident that I wasn't missing any of the action. Since the area television stations were broadcasting live from the scene, I pulled a small portable TV set into my den and hastily plugged it in.

Suddenly I wasn't so sure I was monitoring "all the action." On the television screen, a news reporter was providing a live report that looked and sounded like it belonged in the war torn region of the Middle East.

As his report continued, I could hear various conversations taking place on his hand-held. Sure, I had the media frequencies punched into one of my scanners, but I certainly didn't have his hand-held frequency. Moving closer to the television, I studied the length of his antenna and took a guess that he was operating somewhere on the VHF high band.

Otto Schellin, an engineer on WOXI's "Skylink," provides a "behind the scenes" look into media monitoring.

In addition to the hand-held, he would pause occasionally, press a finger against his earphone, and then continue reporting on the changing conditions.

It was quite evident that information was being fed to him from the main news room. But how? What frequency was being used to transmit those exciting updated reports between the field and the main news bureau?

Years later, the answers to those questions were still unsolved. When I started writing for *Monitoring Times*, it became apparent from your letters that many of you had the same questions.

One such letter, which appeared in the June issue. came from Kevin August. Kevin was interested in monitoring the frequencies used by three Pittsburgh, Pennsylvania, TV stations: KDKA, WTAE, and WPXI.

On reading about Kevin's request in the "Frequency Exchange," Otto L. Schellin, an employee of WPXI TV, not only provided the exact frequencies, but he also included a detailed letter that explained the entire system.

Working as an engineer on WPXI's "Skylink," which is a mobile satellite truck, Otto provided a "behind the scenes" look into the uncharted world of news media frequencies.

According to Otto, 170.15 MHz is WPXI's most often used frequency. Its primary purpose is to dispatch reporters, photographers, and engineers to a scene. It is occasionally used for Interruptable Fold Back (IFB), which is the communications piped into the reporter's earpiece.

IFB is so named because it can be interrupted by the producer or director located in the main news room. This is how the reporter is given time cues and other vital information during a "live" broadcast.

Communications between field units and the engineering staff can be monitored on 455.350. WPXI often refers to this as the "450" channel or channel 2. Otto also points out that channel 2 is sometimes used for IFB communications but not nearly as often as 170.15.

Channel 1 operates on 455.150 MHz and is used for private communications between units that are in the field. However, since this frequency is rarely used, don't expect the scanning action to be sizzlin' hot.

The "Skylink" is also capable of "Electronic News Gathering." More commonly referred to as ENG, the system uses live microwave transmissions in the 2 GHz range. Since ENG microwave signals must be by "line of sight," the range is limited to approximately 20 miles, although ideal conditions can sometimes extend this range to 50 miles or more.

When the Skylink is beyond the workable range of land microwave signals, it utilizes a Satellite News Gathering system or "SNG." This type of transmission operates in the Ku-band (14.0 to 14.5 GHz uplink-11.7 to 12.2 GHz downlink).

Station KDKA (channel 2) uses 166.250 MHz as their main dispatch and communications frequency. The frequency used for IFB communications is 455.750 MHz.

Station WTAE (channel 4) uses 161.670 as the main dispatch frequency and 450.050 for IFB communications.

Otto points out in his letter that the main dispatch frequencies are interesting to monitor because they provide a wealth of information regarding main news events in the Pittsburgh area.

It is also interesting to note that some of the dispatch transmissions may be encrypted. This prevents a competitor

The Satellite News Gathering System (SNG) operates on the Ku band -- 14.0 to 14.5 GHz uplink, 11.7 to 12.2 GHz downlink.

from monitoring a dispatch frequency and responding with their own team of reporters.

Station WPXI uses three Realistic PRO-2004 scanners connected to an omni-directional antenna that is mounted on "Television Hill." In addition to these three scanners, Otto indicated that scanner radios are used in nearly all of WPXI's trucks.

At the end of his letter, Otto provided a 42-page list of Pittsburgh area frequencies. Here is a small sampling from that list:

239.000	Military Tower
255.400	Military Flight Service
337.400	Military Approach
155.235	Life Flight
451.3245	AT&T
154.540	Carnegie "U" security
464.3250/	Century III Mall security
464.3750/.9750	"
180.60/.80	Wireless Microphone-0.5 watts
184.00/.40	"
154.515/.60/.115	Pittsburgh Public Schools
151.625/	Pittsburgh Steelers
467.75/.85/.925	"
43.96/	Purolator Armored Trucks
159.66/.69/.765/.84	"
151.625/	Three Rivers Stadium Ops
467.75/.7625	"
163.20/.8125	U.S. Marshal
163.375/	U.S. Postal Service
164.10/.50/.9625/	"
169.60	"

If you are interested in the complete listing, send an SASE to me in care of *Monitoring Times*. Allow a few weeks for delivery.

MT Treasure Hunt

Hurry, folks! This month marks your last chance to win a wide-band, stainless steel discone antenna.

The "Supercone DC-1515" is a professional grade antenna consisting of 16 elements. All the elements are threaded and the antenna can be easily assembled in less than twenty minutes.

The Supercone was originally manufactured as an all-band receiving antenna for the Ham market. A helically wound whip is also provided for transmitting on ten meters. With the whip installed, the Supercone easily monitored frequencies in the VHF low band between 30 and 54 MHz. When connected to low loss RG-6 coax, I successfully monitored frequencies between 25 and 1000 MHz.

To win this outstanding performer for your roof top, simply find all the clues and send them to Treasure Hunt, P.O. Box 98, Brasstown, NC 28902.

1. WA4PYQ is the amateur call sign for whom?
2. Count the letters in the individual's name found in clue #1.
3. Using the number discovered in clue #2, turn to that particular page in the May issue of *MT*.
4. Name the two objects that are photographed on that page.
5. List the emergency frequency for the objects found in clue #4.

Be sure to get your answers in the mail before September 30. Letters and/or cards that are post marked after the deadline will not be accepted.

The Supercone Antenna retails for about $100.00, and it is one of the best buys on the market. To order your very own wide-band discone, simply write to Procomm/Digitrex, 1948 Coventry Court, Thousand Oaks, California 91362, or phone 805-497-2397.

Frequency Exchange

In the cool evenings of September, Tom Stovall prefers to monitor the sports frequencies. From his home in Birmingham, Alabama, Tom provides the following list:

BIRMINGHAM CITY PARK AND RECREATION BOARD

State Fair	151.625, 170.325
Wireless SX	170.225
Car Phone	453.450
General Use	458.450, 453.450
Referees SX	154.025, 171.025

(Note that these varied in use and not permanent)

BIRMINGHAM GOLF COURSE

Unknown Use	154.600 (not verified)

BIRMINGHAM INTERNATIONAL SPEEDWAY (AUTO)

Administration	467.512, 467.837, 469.500
Race Cars	154.570, 464.550

BIRMINGHAM JEFFERSON COUNTY CIVIC CENTER

Maintenance	37.100
Security	453.375

BIRMINGHAM RACE COURSE (HORSE TRACK)

F1 Racing commission/judges 464.850
F2 Racing commission/ security/med 461.875, 466.875
F3 Track management/barns 463.875, 468.875
F4 Parking, admission, housekeeping/maintenance 469.850
F5 Concessions 464.500
Additional freqs used 464.100, 464.150, 467.300
International Sound Corp. 151.655 (video cameras)

SHOAL CREEK COUNTRY CLUB (GOLF)

Security	35.080 (not verified)

UNIVERSITY OF ALABAMA BIRMINGHAM (UAB)

Police Ch 1	154.800
Police Ch 2	154.995
Paging	453.975
Arena Staff	153.730

(Not monitored: 156.030, 413.175, 453.050, 453.700, 457.525, 458.050, 458.950)

Tom is also interested in contacting other scanner buffs located in Alabama. If you would like to swap frequencies with Tom, write to the Frequency Exchange, P.O. Box 98, Brasstown, NC 28902.

Mark Loether is another scanning buff who is interested in swapping frequencies with other hobbyists. Mark lives in Tomah, Wisconsin, and here is his list:

154.905, 159.450	State Patrol Dist. #5
151.460	State Patrol (statewide)
465.125	State Patrol (mobile repeaters)
170.175	Tomah VA Medical Center
165.0875	Ft. McCoy (security)
165.1875	Ft. McCoy (fire)
241.000	Ft. McCoy Airfield
229.400	Ft. McCoy Airfield
143.450	Air Force (MARS)

From deep within Ocala National Forest, Russell Caldwell reports that the U.S. Forest Service can be heard on 168.750, 169.175, and 168.025 MHz.

Located in Florida, the Ocala National Forest is also home to the Pinecastle Naval Bombing and Electronic Warfare range. Russell indicates that he monitors the range on the following: 357.000, 359.400, 350.400, 289.400, 321.800

When Russell gets tired of listening to the bombing runs, he relaxes by monitoring the Florida Freshwater Fish Commission on the repeater frequency of 160.140.

In trade for the frequencies provided, Russell needs your help. Does anyone have the "RECON" frequency used by sheriff's deputies in rural Florida? Russell indicates that local business establishments can contact the sheriff through a VHF radio. Comments, anyone?

Since this column started off with a bombing, we may as well continue... If you are visiting Nekoosa, Wisconsin, Joseph Sepulvado wants to share the frequencies used at the U.S. Air Force Bombing Range located at Hardwood:

134.100	138.250	138.350	138.450	269.400	275.800
314.200	342.500	358.200	379.400	389.900	413.375

In return for his generous offering, Joseph desires the military frequencies for Fort McCoy and Volk Field.

In the Tar Heel State, Lloyd R. Davenport has been monitoring the following frequencies from his home in Aberdeen, North Carolina:

42.52, 42.76	State Police
47.54	U.S. Forest Service
155.34	Moore County Regional Hospital
453.225	Pinehurst Police
453.450	Aberdeen Police
453.725	Southern Pines Police

From my "Top Secret" letter file a person named "John" sent in 165.375 as a confirmed frequency for the Secret Service. John lives in Shawnee Mission, Kansas, and monitored this well-known Presidential frequency during the last election.

If the President comes to your town, be sure to monitor the following:

166.40, 164.80, 165.785, 166.4625, 166.510, 166.610, 166.640, 166.70, 167.025, 169.625, 169.925.

The Kansas Turnpike Authority phone patch frequency is 155.115. Robert Barber of Olathe, Kansas, found that little gem during one of his scanning sessions and he would also like to share the following:

151.085, 151.100	Turnpike Maintenance
154.830, 154.680, 154.905	State Patrol

Robert also discovered that the army reserve helicopters at Gardner, Kansas, use 46.900. In trade, Robert would like to have the repeater input frequencies for the Kansas State Patrol. If you got 'em, why not share them with thousands of other *MT* subscribers.

To see your favorite frequencies in print, send them to the Frequency Exchange, P.O. Box 98, Brasstown, NC 28902.

Mysterious Garage Doors

According to the *San Francisco Chronicle*, the United States Navy is transmitting a strong radio signal that is jamming the frequency used by some brands of electric garage door openers. Since garage door openers are low on the list of FCC priorities, there hasn't been an all out effort to uncover the source of the jamming signal.

The phenomenon has been reported in Concord, Clayton, Orinda, Walnut Creek, Lafayette, Morago, Danville, San Ramon, and Livermore.

Anyone care to look into this further? Hey, don't laugh. It could get interesting if not down right intriguing. So go ahead, give it a shot and let me know what you find. (News clipping submitted by Mike Ryan, California).

Expensive Weather Reporting

The Massachusetts Aeronautics Commission recently paid $25,000 for a weather broadcast system on Mount Wachusett. At 2,006 feet, the Automated Weather Observing System (AWOS) continuously broadcasts the weather information 24 hours a day on 118.025.

According to the commission, the cost was justified because pilots need timely and accurate weather reports. I wonder if anyone on the commission has ever heard of the NOAA weather channel?

Next month . . .

Don't miss the October issue of *MT*. It begins our last Treasure Hunt and the prizes include two frequency counters from Opto Electronics.

Keep on Scanning!

Bob Kay's first book, the Citizen's Guide to Scanning, will be published this fall by DX Radio Supply. Look for it at your favorite book or radio store.

GRUNDIG
SATELLITE 25th ANNIVERSARY

EEB and GRUNDIG Present This Fabulous Sale to Celebrate the 25th Anniversary of the World Famous Satellite Shortwave Receiver.

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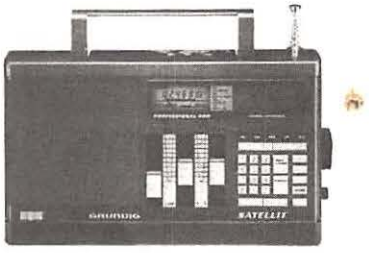

SATELLIT 400: A High Performance Compact World Band Receiver. LCD Display, 24 Station Memory, Direct Keypad Tuning and Bass/Treble Controls are Some of It's Major Features. AM/FM/SW with Excellent Sound Quality and High Sensitivity. **Call for sale price!**

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what's new?

Underground Frequency Guide

Underground Frequency Guide

Strange things are heard on shortwave. Mechanical, prerecorded voices of women reading strings of numbers in Spanish, German, English and Russian. Drug smugglers. Latin American guerilla forces. Mysterious "beeps" and pulses.

What are these stations? And what are they used for? And when can they be heard? Conventional shortwave frequency guides are generally of little help in unraveling such puzzles.

The Underground Frequency Guide is one of the most comprehensive frequency directories ever compiled. Over 400 currently active frequencies are given in this 47 page booklet along with transmission times, modes, languages, and a brief description of what can be heard on each frequency. Also included is an introduction to underground and covert radio.

Underground Frequency Guide is available from DX Radio Supply, P.O. Box 360, Wagontown, PA 19376, for $6.95 plus $1.00 USPS shipping.

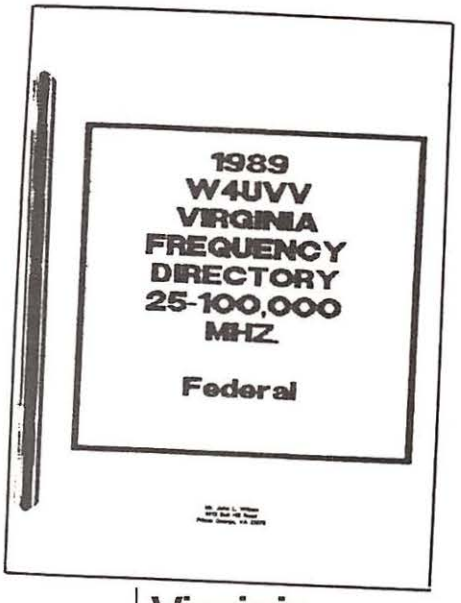
UTC Conversion Chart

Let's face it. Trying to instantly convert UTC into local time (and vice-versa!) can be a pain. That's why DX Radio Supply has come up with a handy, wallet-sized UTC-local time (and reverse) conversion chart. Encased in plastic, it's quite handy for at-a-glance use.

The DX Radio Supply UTC conversion chart is available for $2.00 cash from P.O. Box 360, Wagontown, PA 19376.

New Part 97 Rules

The new Part 97 Rule Book for amateur radio service is available from W5YI. The booklets contain not only the entire text of the new rules but the entire *Report & Order* detailing amateur comments on the rules revisions and the FCC consideration given to them. To order, send $2.00 to P.O. Box 565101, Dallas, Texas, 75356.



Virginia Frequencies

Probably few serious VHF/UHF monitors in the world have the detailed computer base that John Wilson has for his listening area. Covering all of Virginia and some geographical spillover into Maryland, John's database occupies 6 megabytes of memory on his computer.

John is now making this highly accurate information available to other scanner enthusiasts; his lists are not culled and include some of the most sensitive frequencies in the nation.

At present, John's directories are entitled Aviation, Business, Federal, Marine, Military, Public Service, Radio/TV/Press, Railroad and Miscellaneous. For $175 John can send a master database printout of all nine services.

The frequency range covered by the directories is 25 MHz through 10 GHZ, although the vast majority of listings are below 1000 MHz.

Even a brief glance through the list of agencies covered in these directories reveals the scope of its breadth -- FAA, HUD, CIA, VOA, space, police, FCC, Marshals, ATF, WHCA, Treasury -- on and on for almost 100 separate services, agencies and bureaus!

For east coast scanner enthusiasts, this collection is an eye opener and, since most federal and military listings are nationwide, the list provides excellent insight into government communications users across the country.

The computer printouts cost $15 to $75 depending upon service. Contact John Wilson, 6413 Bull Hill Rd., Prince George, VA 23875; call 1-804-862-1262 for ordering information.

1990 Passport News

The new 1990 edition of *Passport to World Band Radio* is reportedly due to ship to distributors sometime around the 14th of this month. Barring delays, expect the book at your door before the end of September.

Trap that Zap!

Antenna Supermarket, manufacturer of the highly-rated Eavesdropper dipole and sloper antenna, is now offering Gas Tube Lightning Arrestors. Called Zap Trappers, the units feature a UHF "T" connector (M-358).

There are two models of Zap Trappers. Recommended for receivers (and transmitters up to 200 watts PEP) is the LP/T. Its suggested retail price is $14.95 -- a full $8.00 cheaper than other comparable models. The other, called the HP/T, is good for amplifiers with up to 2,000 watts PEP output and retails for $16.95.

Zap Trappers are built of high quality US-made connectors with solid-brass hardware and cast aluminum boxes.

For more information on the Zap Trapper, contact Antenna Supermarket, P.O. Box 563, Palatine, IL 60078.

Microwave Eavesdropping

For those readers concerned with the pervasiveness of government snooping into private lives, this new book should bolster the paranoia of the most complacent American.

Based upon the 1978 testimony of David L. Watters as given before the Senate Select Committee on Intelligence regarding Senate Bill 1566, the Foreign Intelligence Surveillance Act of 1977, *Microwave Eavesdropping* paints a portrait of citizen vulnerability.

Watters begins by showing a revealing map of the microwave circuits which surround the Pentagon, many of which lead suspiciously to Ft. Meade, Maryland -- home of the National Security Agency (NSA).

The book is a compilation of wiretapping history, tutorial lessons in governmnent surveillance and voluminous bibliographies. All very informative.

Due to be *released shortly, Microwave Eavesdropping* will be $15 from Sherwood Communications, P.O. Box 535, Southampton, PA 18966.

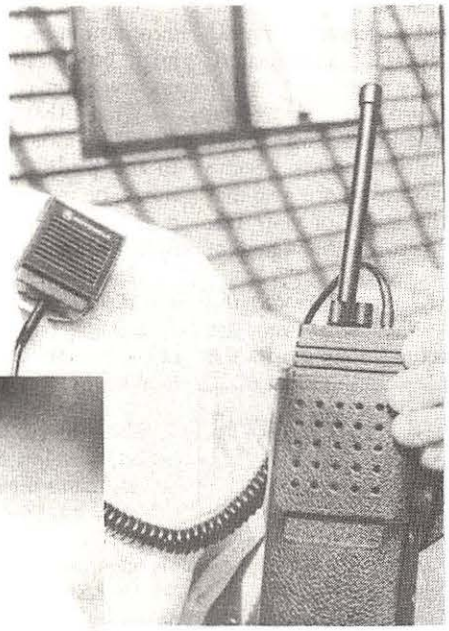
Lapel Speaker for Hand-helds

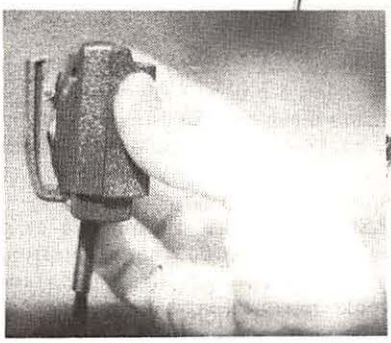
CLH Engineering has announced a small, clip-on lapel speaker for scanner and hand-held transceiver users.

Built into a rugged Motorola-type microphone enclosure, the powerful speaker unit measures slightly over two inches square by one inch depth, yet delivers strong audio when the reinforced plug at the end of its professional coil cord is inserted into the standard 1/8" (3.5 mm) jack on a portable scanner or transceiver.

Designed to be clipped to a shirt, jacket or uniform lapel by its strong, spring-loaded clip, the lapel speaker concentrates its high-quality sound on the ear of the listener without the need of turning the radio's volume conspicuously loud when worn on the hip.

Only $30 plus $3 shipping in the U.S. from CLH Engineering, P.O. Box 5576 EKS, Johnson City, TN 37603.





To have your new product or book considered for review in Monitoring Times, send it to Editor, 140 Dog Branch Road, Brasstown, NC 28902.

Amateur Radio Database

For decades, the only way hams and SWLs could get information on the nations nearly-half-million hams was either to subscribe to the *Amateur Radio Callbook Magazine* or acquire the FCC amateur radio database on microfiche or microfilm.

With the evolution of compact disc digital technology, however, more than music can be put on these 4-1/2" aluminum platters! Buckmaster's newly-released CD-ROM contains the particulars on every US ham.

Name, address, license class and other details are listed, just as they are filed with the FCC; even clubs, military and RACES stations are included.

As if this weren't enough, Buckmaster has included over one hundred BASIC computer programs of interest to amateur radio operators and radio hobbyists in general.

To access the data on this disc, you will need a CD-ROM player like the Hitachi, Sony or Philips units; an IBM or compatible computer, version 3.1 or later; and 640k resident RAM. The disc uses ISO-9660 standard, accessed by Microsoft CD-ROM extensions above version 2.0.

Later versions of the CD-ROM are expected to include foreign call signs data, longitude/latitude for 1 million locations, lists of QSL managers, even AM/FM broadcast frequency files.

The "Hamcall" Database on CD-ROM is $100 postpaid from Buckmaster Publishing, "Whitehall", Route 3 Box 56, Mineral, VA 23117; credit card orders 1-800-282-5628.

T.J. "Skip" Arey WB2GHA

P.O. Box 644
Waterford Works, NJ 08089

How to Tell Time, and More!

The modern "Digital" age has brought us both a blessing and a curse. It seems that any home gadget more complicated than a can opener now contains some manner of microprocessor control.

Many manufacturers like to add a little pizazz and additional functionality to their devices so they often include a digital clock. These timer circuits can turn on your coffee, turn off your VCR, or turn down your home heating unit. Where we once had the clock on the mantle, we now have clocks in every appliance.

All these little LED readouts blinking happily throughout the modern household.

Ah . . . This has something to do with radio, Uncle Skip???

You betcha!!! How many times have you come home from a hard day of working in the salt mines to find all these little digital readouts blinking zeros, eights, or not blinking at all because the local power went out for a few seconds during the day?

Whenever the power goes bye-bye, you have to run around and reset all those little clocks to bring your modern world back to an even keel.

Now those folks who never played radio tend to just glance at their wristwatch and set all the clocks to that relative time. Radio people tend to do something a bit different. They walk their wristwatch over to their "world band" radio and tune up to 10000 kHz.

Bing . . . bing . . . bing . . . bing!

Click . . . click . . . click . . . click . . . click!

"At the tone . . . twentytwo hours, twentynine minutes Coordinated Universal Time." BEEEEEEEEEEEEEP!!!

With that, the radio freak zeros his wristwatch and then goes about the task of making all those little clocks dance to the same beat. Having direct access to a time signal station such as WWV gives a person a feeling of power and control over this modern world. After all, with a watch set to WWV, you now know what time it REALLY is and the rest of the world had just better listen to you!

By tuning in the time signal stations interspersed throughout the radio spectrum, you too, can become a certifiable time lord. You will be able to observe to those around you at the bus stop that the "local" was one minute, thirteen seconds late today.

You can smile quietly to yourself as you notice the office clock is three minutes, forty-one seconds fast. You can tell the waitress at your favorite diner to bring you a "real" three minute egg, none of this two minutes, forty-five second stuff.

Or you can use the information provided by time signal stations to further your abilities as a radio monitor.

What a perfect lead in to . . .

Uncle Skip's Guide to Time Stations

As you might guess, there are more reasons to tune in time signal stations than to drive all your companions crazy with your obsessive self-righteousness.

WWV, Fort Collins, Colorado, and its sister station WWVH, Kekaha Kauai, Hawaii, broadcast twenty four hours a day on 2.5, 5, 10, 15, and 20 MHz with continuous time signals from a super accurate atomic clock. This clock establishes its time base from the zero-field atomic resonance of the element cesium.

This clock, in fact, is even more accurate than good old mother earth. Periodic fluctuations in the earth's rotation need to be accounted for against the cesium clock. Every few years, the engineers at Fort Collins have to add a "leap second" to compensate for the difference.

Of all the QSL cards in my personal collection, the one that draws the most interest from uninitiated observers is my 31 December, 1979 2359:60 UTC "Leap Second" card.

Correct UTC (Coordinated Universal Time) is important to the listener who wants to give accurate reception reports. Some folks wire up a stereo cassette recorder so that one channel records the audio of your DX session and the other records the signal of WWV from another receiver.

This rig will allow you to make "to the second" observations about what you are hearing. But most people simply use the time signal station to bring the clock at their listening post up to date.

When conditions are right, both WWVH and WWV can be heard on the same frequency.

Many time signal stations give you just that, time signals and nothing more. WWV and WWVH give the listener a great deal more information particularly useful to furthering one's enjoyment of the radio hobby.

For instance . . . at 8, 9, and 10 minutes after the hours on WWV and at 48, 49, and 50 minutes after the hour on WWVH, maritime storm warning reports are broadcast. Utility DXers can use these broadcasts to forecast increased radio activity as ships and shore stations try to cope with mother nature. These announcements are 45 seconds long and are provided by the National Weather Service.

But that's not all.

On the eighteenth minute after the hour on WWV and the forty-fifth minute after the hour on WWVH, these stations broadcast Geophysical Alerts. These reports include the solar flux and "A" index for the previous UTC day and the "K" index for Boulder, Colorado, which is updated every three hours. The bulletin will also include the current state of the earth's magnetic field and some predictions about conditions over the next twenty-four hour period.

The folks at Fort Collins pack all this information into just forty-five seconds, so it might be wise to have a tape recorder hooked up so you don't have to re-listen an hour later.

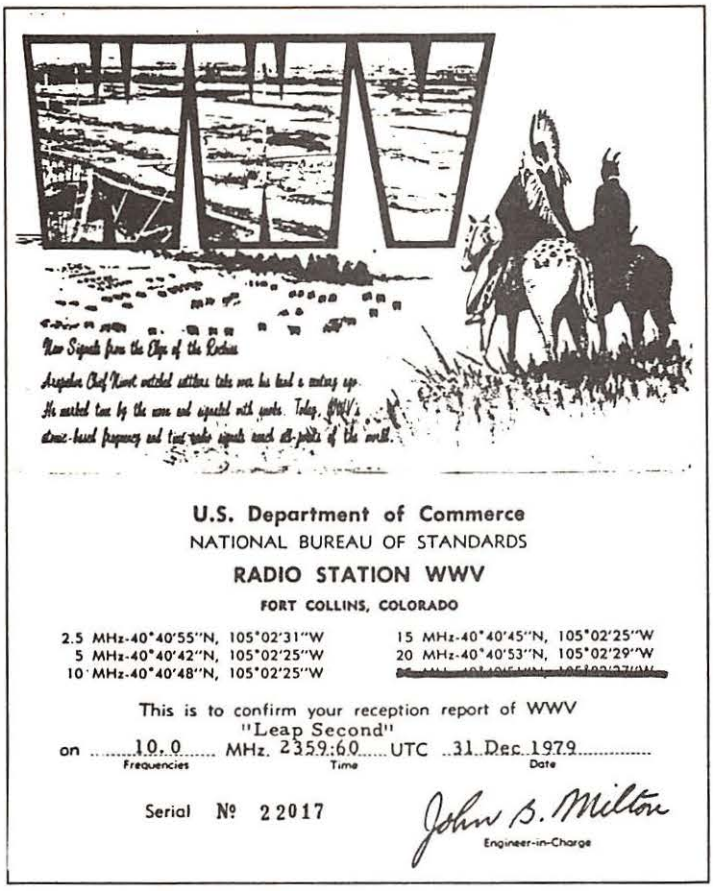
What's that, Compadre? All of this "A" index "K" index stuff is just gibberish to you? In the words of the immortal bard, "Don't worry, be happy"! Scientists are still arguing over what it all means anyway. Why should things be any different for you?

If you ever listen to the ham bands you will discover that every third conversation is an argument over "The WWV report." (The other two are probably about the "no code" ham license but we won't get into that again.)

Hang loose, pal. Hobby radio folks can quickly develop a practical understanding of all this data's meaning. So listen up and you too can start your own personal "A" index chart to guide you through the pathways of propagation.

The SOLAR FLUX is expressed as a numerical figure derived essentially from counting the sunspots. A figure of 65 or lower would be typical in years of minimum solar activity. An intermediate figure would range from 100 to 200.

High solar numbers tend to mean bad news for shortwave listeners who are tuned



Periodically WWV must make corrections to their clock.

into the lower HF bands but VHF scanner people might find some interesting DX as the figure creeps above 200 and conditions above 50 MHz tend to be enhanced. That's what's neat about having both a shortwave receiver and a VHF scanner. When conditions are bad for one they are great for the other.

The "A" index is usually the most widely discussed figure in the DX community. The "A" index is a 24 hour figure expressing the geomagnetic field of good old mother earth. The scale runs from 0 to 400+, but rarely sees the high side of 100.

Without getting into the subject too deeply, (entire books have been written on propagation), an "A" index of less than ten can be considered pretty much ideal for the SWL. The lower the figure, the less the signal is absorbed by the earth's geomagnetic field. Under these conditions, signals travel farther and better.

The "K" index can be thought of as a more up-to-date "A" index. It is updated every three hours. It is also computed with slightly different mathematics that take into account more subtle changes in the earth's field. This figure is useful in making your own prediction of how things are going to stack up over the next twenty-four hours.

If the figure is floating around three, things should be pretty good for playing DXer. If the figure starts to creep up to four or five, you might just want to look for band openings with your scanner. These higher figures indicate the beginnings of enhanced VHF activity due to auroral conditions. If you have just been using your scanner for listening to the local constabulary, give WWV a listen and move up to the fun and excitement of VHF DXing.

Many other factors figure into propagation monitoring, but for the beginner, charting the indexes provided by WWV and WWVH will give you a good handle on the basics. If you are interested in a more technical explanation of the meaning behind the WWV Geoalert Bulletins, you can write NOAA Space Environment Services Center R43, Boulder, Colorado 80303.

One of the most unique services provided by WWV and WWVH actually benefits the music world. You see, normally the tone that signals the passing seconds is a 600 Hz tone. However, on the third minute after each hour, the tone is changed to 440 Hz concert pitch, probably the most accurate source in the world for tuning your guitar or whatever instrument you play. Mighty thoughtful of those folks out in Colorado, huh? Keeping all those banjo players around the world in tune with one another.

Now I can just bet that some folks out there are jumping up and down saying "For crying out loud, Uncle Skip, if they broadcast on the same frequencies, how can you tell the difference between WWV and WWVH?"

No problem, Bunky! WWV makes its time announcement in a male English voice at 7.5 seconds before the minute. WWVH makes its time announcement in a female English voice at fifteen seconds before the minute. When conditions are right, you can hear both stations simultaneously.

If you listen really closely, you might even hear other time signal stations such as LOL, Buenos Aires, Argentina, or even BPM. Xiam, China, underneath the North American signals.

The fact is that there are over thirty time signal stations out there in radio land just waiting to be logged. Most send out really nice QSL cards too. What complicates matters is that they mainly tend to occupy the same frequencies as WWV/WWVH so you have to dig them out.

However, some show up in other places and make for interesting catches. Try for YVTO, Caracas, Venezuela, on 6100 kHz or CHU, Ottawa, Canada, on 7335 kHz. For a complete list, take a gander at the *World Radio TV Handbook*, available from many advertisers here in *Monitoring Times*.

Old Uncle Skip's personal favorite remains WWVH. Whenever the bands are open, I love to tune in to that sultry female voice. My mind wanders to images of sandy beaches and muumuu clad island women doing the hula and chanting . . .

"At the tone . . . Twentyone hours, fortytwo minutes Coordinated Universal Time."

I'm an incurable romantic at times!

Dave Jones

430 Garnor Drive
Suffield, OH 44260

Monitoring Military Aircraft

"Tomcat 03 to Havoc 11, we will be entering the M.O.A. at 1600 Zulu and rendezvousing at 1611 Zulu, estimate refueling time at five minutes."

"Cobra 10, you have one coming in at two o'clock, break hard right and engage."

The monitoring of military aircraft is an enjoyable pastime for many scanner enthusiasts across the nation. Military aircraft can be monitored over a wide variety of frequency ranges which enable most any programmable scanner as a monitoring instrument for military aircraft.

Table 1 lists the common frequency operating ranges for military aircraft and the most common mode of transmission such as AM or Narrow-Band FM (NBFM). When more than one mode is used, a primary and secondary mode is highlighted.

The 225 - 400 MHz range contains by far the most available military aircraft traffic to monitor; however, it is by no means the only location to monitor them.

Starting with the VHF LB frequency range of 30 to 88 MHz, operations from all U.S. military aviation services are found from the reserves and the Air National Guard (ANG) to the full-time armed services.

This frequency range is utilized for a variety of functions. A common use of this range is for air-to-ground communications between air-to-ground attack aircraft and ground troops for coordination of activities. Tactical Forward Air Controllers (FAC) also utilize the VHF LB frequencies for spotting activities with the aircraft.

Table 1
Military Aircraft
Frequency Ranges

30 - 88 MHz	NBFM
118 - 136 MHz	AM
138 - 144 MHz	AM primary; NBFM secondary
225 - 400 MHz	AM primary; WBFM, NBFM, and MUX
406 - 420 MHz	NBFM primary; AM secondary

Air-to-air tactical communications are quite common, especially among the reserve and ANG units. Air-to-air tactical communications are common during war games when aircraft with VHF LB capability switch to the LB channels and discreetly communicate with each other. The "enemy" is on UHF and is unable to monitor the VHF LB communications.

Military helicopters can be monitored here with both operational and tactical channels. Operational channels are defined for the purpose of this column to be operations headquarters or air traffic control (ATC). Tactical channels are defined for the purpose of this column as channels which are utilized between aircraft during maneuvers or flight tests.

Table 2
Military Aircraft Frequencies

126.200	Common military towers
130.650	U.S.A.F. MAC CP
134.100	Ground Control Approach
235.100	U.S.A.F. Aerial Refueling (AR) primary
236.600	Common tower
238.900	U.S.A.F. AR primary
243.000	UHF "Guard Channel" (emergency)
255.400	FAA Flight Service Stations (FSS)
257.800	FAA Civilian Tower common
260.200	U.S.A.F. AR alternate
272.700	FAA-FSS
273.500	ATIS - Automatic Terminal Information Service
275.200	METRO - U.S.A.F. Meteorology
276.500	U.S.A.F. AR primary
282.700	U.S.A.F. AR alternate
283.900	U.S.A.F. AR primary
289.700	U.S.A.F. AR primary
293.000	U.S.A.F. AR primary
295.400	U.S.A.F. AR primary
295.800	U.S.A.F. AR primary
311.000	U.S.A.F. SAC primary CP
319.500	U.S.A.F. AR alternate
319.700	U.S.A.F. AR alternate
320.900	U.S.A.F. AR alternate
321.000	U.S.A.F. SAC alternate CP
340.200	U.S.N. Tower common
343.500	U.S.A.F. AR primary
344.700	U.S.A.F. AR primary
349.300	U.S.A.F. MAC UHF CP
360.200	U.S.N. Tower common
364.200	NORAD
372.200	U.S.A.F. Pilot-to-dispatch
381.300	U.S.A.F. TAC CP

The next stop on the dial is the VHF AM aircraft band between 118 and 136 MHz. Military aircraft can be monitored communicating with some towers that are not equipped for UHF communications.

Military towers can also be monitored often simulcasted with UHF frequencies. ANG units utilize this range for tactical channels used during training.

The U.S.A.F. Military Airlift Command (MAC) command post (CP) may be monitored on 130.650 MHz and MAC aircraft in transit may be monitored nationwide communicating with various MAC facilities. Table 2 lists common military aircraft frequencies such as the MAC CP frequency.

Moving up the dial a few megahertz, the military range of 136 to 144 MHz appears. The eight megahertz portion of the VHF HB spectrum below the two meter amateur frequencies is loaded with military activity, including aircraft operations.

The entire range is dedicated virtually to the military with only a very few federal agencies present. I consider this range to be the least monitored for military aircraft activity from letters received and conversations with monitors.

This range is a haven for training operations, especially in the vicinity of airbases and test ranges. The primary mode is AM.

Table 3
Military Aircraft Call Signs

Canforce	C-130 (cargo)
Cutty	T-38 (trainer)
Dude	KC-10 (tanker)
Flame	F-14
Fury	A-7
Gull	C-130
Gumby	B-52
Hunt	C-141
Hunter	F-14
Knight	F-18
Mar	AV-7
McCoy	F-16
Norse	B-1
Pacer	C-21
Peach	F-15
Pearl	KC-135
Sentry	E-3
Shamu	KC-10
Tame	C-5

Tactical and operational channels can be monitored with tactical usage being in the majority of monitorable traffic. The U.S.A.F. and U.S.A. are the prime users of this range with respect to military aircraft.

The cat's meow of military aircraft frequency ranges is the 225 - 400 MHz range which is devoted virtually exclusive to the U.S. military with NASA and the U.S. Coast Guard being the two most notable exceptions.

The 175 MHz swath of the RF spectrum between 225 and 400 MHz offers the monitor endless hours of searching and seeking new frequencies. Once the frequencies are found for local operations (either tower or aerial refueling) then additional frequencies may be uncovered from monitoring communications between the aircraft and the tower or ATC.

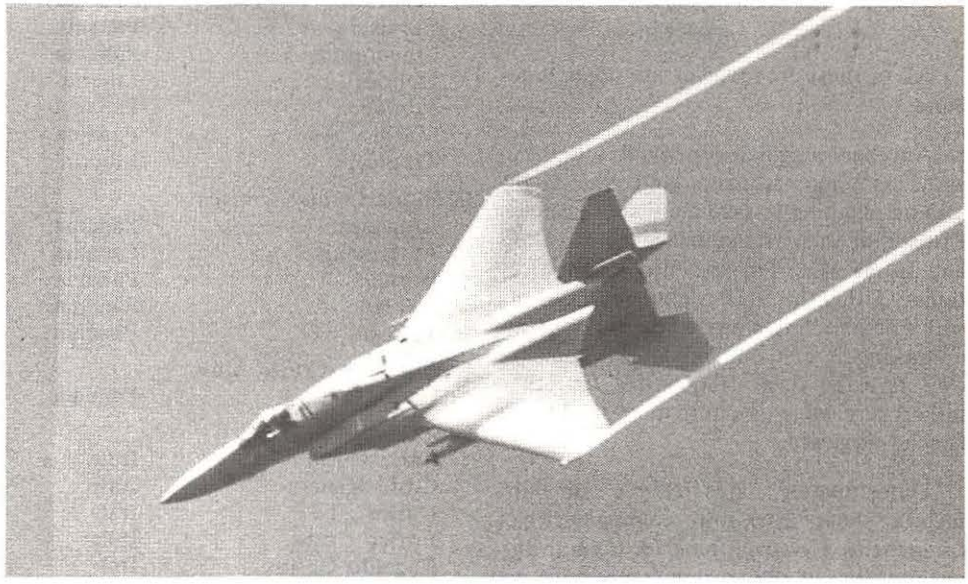
The 225 - 400 MHz has been presented in detail in previous Federal File columns and will not be covered in detail in this issue. Refer to the December 1988 issue of *Monitoring Times* for more information.

The last frequency range listed is the 406 - 420 MHz federal band. The band is reserved for federal and military operations with very little military aircraft operations. It is listed here for completeness.

An excellent source of frequencies for this range, as well as all other ranges, is either the *Federal Frequency Directory*, (published by Grove Enterprises, but now out of print) or the Government Microfiche File set. (Note: The *FFD* was essentially a hardcopy printout of the microfiche data for frequencies between 25 and 470 MHz).

Military aircraft utilize tactical call signs like Tomcat and Havoc used in the opening example. Monitoring and compiling the calls can be a hobby unto itself, in addition to the other aspects of military aircraft monitoring.

Mark Holmes of College Park, Georgia, is a serious call sign intercept enthusiast who supplied the list of call signs that appear in Table 4. He would like to hear from other serious military aircraft monitors to exchange confirmed, intercepted call signs. Mark can be contacted at 1539-F Shoreham Court, College Park, GA 30349.



Air-to-air tactical communications are quite common, especially among the Reserve and National Guard units. Johnny Autery of Dixon Mills, Alabama, caught this Louisiana ANG F-15 intercepting an RF-4 over southwest Alabama (Camden Ridge MOA). Catch it on your scanner!

The call signs listed in Table 3 are representative of the hundreds Mark sent to the Federal File. Notice the wide variety of aircraft present in the listing. The calls may not be exclusive; similar calls may be used elsewhere to represent a different type of aircraft or group of aircraft.

Some of the calls appear to have a wit about them (like Shamu for the KC-10 tanker) while others appear to be pulled from the blue sky.

Comments and suggestions for future Federal File columns are solicited. Let me know what you want to read about in the Federal File and perhaps a column will appear on the subject. Remember to enclose an SASE if you desire a personal response.

James R. Hay
141 St. John's Blvd.
Pointe Claire, PQ, Canada H9S 4Z2

Cruise Ships Revisited

At the beginning of the year there were several articles printed about monitoring cruise ships and the radio traffic which they generate.

Reader William Dickerman suggests 12354.8 kHz as a good frequency for monitoring cruise ship traffic, particularly between 2245 and 0006. He has also had good luck monitoring cruise ships on the following frequencies:

8198.1 kHz	8288.0 kHz
8207.4	12345.5
8222.9	12351.7
8226.0	12361.0
8235.3	12398.2
8269.4	16487.9
	16553.0

All of these frequencies are upper sideband.

Another suggestion arrived for those with hand-held scanners and who might also be planning to take a cruise. Princess Cruises, on their Island Princess, use 161.35 and 161.45 MHz for on-board communications. Using the VHF for communications with line handling crews while docking and undocking is common on larger ships, as well as using these frequencies for other tasks where using an intercom to the bridge can be awkward.

Unfortunately, my records do not include these intra-ship communications frequencies. However, look for them in the general area of the marine frequencies, or on the unused portion of duplex channels.

If any of you have information regarding frequencies used for on-board communications, please forward them to me so that they can be shared with other readers.

With the talk of monitoring the cruise ships, perhaps a listing of the larger cruise ships which can be heard is in order. Most of these ships are in the worldwide or Caribbean cruise business and can provide interesting monitoring.

The ships are grouped by the cruise line which owns them and are listed alphabetically. In some cases the call sign is given after the name of the vessel. The column on the right shows the country of registry of each ship.

Admiral Cruises	
Azure Seas	Panama
Emerald Seas	Panama
Stardancer	Bahamas
American Hawaii Cruises	
Constitution	USA
Independence	USA
Liberte	Panama
Astor Cruises	
Astor	Mauritius
Bahamasama Cruise Line	
Bermuda Star	Panama
Veracruz	Panama
Carnival Cruise Line	
Festivale	Panama
Carnivale	Panama
Celebration	Panama
Holiday	Liberia
Jubilee	Panama
Mardi Gras	Panama
Tropicale	Liberia
Chandris fantasy Cruises	
Romanza	Panama
Amerikanis	Panama
Britanis	Panama
Galileo	Panama
Victoria	Panama
Commodore Cruise Line	
Caribe I	Panama
Costa Cruises	
Carla Costa	Italy
Costa Riviera	Italy
Danae	Italy
Enrico Costa	Italy
Eugenio Costa	Italy
Daphne	Italy
Cunard Line	
Cunard Countess/GUNP	Gr. Britain
Cunard Princess/GUNN	Gr. Britain
Queen Elizabeth 2/GBTT	Gr. Britain
Sagafjord	Bahamas
Vistafjord	Bahamas
Dolphin Cruise Line	
Dolphin IV	Panama
Epirotiki Lines	
Atlas	Gr. Britain
Jason	Gr. Britain
Jupiter	Gr. Britain
Oceanos	Gr. Britain
Pegasus	Bahamas
World Renaissance	Gr. Britain
Exprinter Cruises	
Berlin	W. Germany

Harry Baughn

Using VHF for communications with line handling crews while docking is common on larger ships.

Hapag Lloyd	
Europa	W. Germany
Holland America Line	
Nieuw Amsterdam	Netherlands Antilles
Noordam	Netherlands Antilles
Rotterdam/PJSU	Netherlands Antilles
Home Lines	
Atlantic	Panama
Homeric	Panama
K-Lines Hellenic Cruises	
Constellation	Gr. Britain
Galaxy	Gr. Britain
Orion	Gr. Britain
Norwegian Caribbean Cruise Lines	
Norway (ex France)	Norway
Skyward	Norway
Southward	Norway
Starward	Norway
Sunward II	Norway
Ocean Cruise Lines	
Ocean Islander	Panama
Ocean Princess	Panama
P & O Line	
Canberra/GBVC	Gr. Britain
Paquet French Cruises	
Azur	Panama
Mermoz	Bahamas
Pearl Cruises of Scandinavia	
Pearl of Scandinavia	Bahamas
Polish Ocean Lines	
Stefan Batory	Poland
Premier Cruise Lines	
Oceanic	Panama
Royale	Panama

READER FEEDBACK

... it's the kind of "interference" MT authors *like!*
Is *your* signal coming in loud and clear?

Princess Cruises (P & O Line)	
Island Princess/GBBM	Gr. Britain
Pacific Princess/GBCF	Gr. Britain
Royal Princess	Gr. Britain
Sea Princess/GBBA	Gr. Britain
Sun Princess/GBFT	Gr. Britain
Regency Cruises	
Regent Sea	Panama
Rhapsody	Bahamas
Royal Caribbean Cruise Line	
Nordic Prince	Norway
Song of America	Norway
Song of Norway/LNVP	Norway
Sovereign of the Seas	Liberia
Sun Viking	Norway
Royal Cruise Line	
Crown Odyssey	Gr. Britain
Royal Odyssey	Gr. Britain
Golden Odyssey	Gr. Britain
Royal Viking Line	
Royal Viking Sea	Norway
Royal Viking Sky	Norway
Royal Viking Star	Norway
Salen Lindblad Cruising	
Funchal	Portugal
Sitmar Cruises	
Fairsky	Liberia
Sun Line	
Stella Oceanis	Gr. Britain
Stella Solaris	Gr. Britain
Swan Hellenic Cruises	
Orpheus	Gr. Britain
Venice Simplon-Orient Express	
Orient Express	Bermuda
World Explorer Cruises	
Universe	Liberia

For those looking for more detailed information on the cruise business, Mr. Dickerman suggests the publication, *Official Steamship Guide International*, whose address is 111 Cherry ST., Suite 205, New Canaan, Connecticut 06840.

This publication includes maps showing ports of call, an alphabetical list of cruise ships, schedules, and a list of cruise operators.

Until next time, good listening, and "keep those cards and letters coming."

mt

Ike Kerschner, N3IK

R.D. 1, Box 1237
Kunkletown, PA 18058

Contesting

Is your ham station ready?
Are you all set?
Then GO for it!

Cary, NC, ARC members
Field Day 1989
Photo by Harry Baughn

Well, here it is September, the end of summer and the beginning of fall -- just the right time to start getting ready for the big ham radio contest season.

Contesting is another way to have some fun with your radio. Try it! If you have never operated a contest I urge you to give it a shot. What could happen? Nothing much except that you just might have fun, learn a heck of a lot, become a better operator, meet new friends, and add a few new countries, counties, grid squares, zones or whatever to the worked list.

Getting Started

Choose a contest that you are interested in. Some of the more popular ones are the CQ DX, ARRL DX, Sweepstakes, 10 - 10, CQ WPX, ARRL VHF, and of course the summertime favorite, Field Day. These are but a few of the dozens of contests that are held each month. A complete list can be found in any ham radio magazine.

Decide as early as possible on which contest you want to operate in. Then write off for forms and rules. Study the rules carefully. Then plan a strategy for winning and go for it. The idea is to immerse yourself in the test and savor every battle you get into.

Remember the whole reason for contesting is to compete. Don't worry about the guy with the full gallon (legal limit of power), fancy gadgets and big antennas. They can be beat by a good operator with a very modest station.

The other thing you must be aware of is that you are competing only against stations in your own category. For example, if you choose to operate a contest as a single operator station, you will only be competing with other stations in the same class.

Planning

The next step is to get some kind of forecast for propagation. The charts in this magazine will provide some measure of knowledge as to what to expect from the various bands at a given time.

You can get even more up-to-date propagation information, however, by listening to station WWV and using a personal computer to sort it all out. Now we know what time to be active on a particular band.

Are you working a phone contest, CW, RTTY? Check out the station gear to be sure everything is in tip top shape. If you are in a CW contest get in a little before-contest practice to be sure the bug, keyer or keyboard is working smoothly.

Now is also the time to set up your exchange message and review it if you are using a memory keyer. A memory keyer is a nice accessory to have in a CW contest, but it is not necessary to have one in order to produce a winning score.

While in the planning stages consider the hours you will be working the contest and consider the other members of your family. Unless the shack is sound proof or removed from the main part of the house, you should consider a good set of headphones. Get a set that will not tire you after being used for a long period of time.

Check the antenna system. If you are using a rotor, be sure it is aligned correctly and functioning well. Check out the transmatch tuning and make a tuning chart for fast tune-up. (A chart will list the correct inductor switch and capacitor positions for each band.) Be sure the ground system is in good shape, securely attached to the ground rod (radials) and the station transceiver (or rig).

Record Keeping

Every contest demands some kind of log be sent in with the claimed score. It is most important this log be accurate and easy to read. For many years the only way of doing this was with paper and pencil, or by typewriter.

Today even the least expensive computers can do this easier and faster; so if you don't own a personal computer you might consider purchase of one. The computer will keep the log, tell you if you worked a particular station (eliminate dupes) and print out a neat clean log and summary at the end of the contest.

Many stations still use the manual method of logging and dupe checking and do a fine job of it. So not having a computer should not keep you from entering the contest; but if you get into many tests, you will find a computer worth its weight in pencils.

Comfort

The quickest way to a low score is to have a station that is not comfortable to operate. Your mike or key should be in a position that will allow you to use it in a relaxed fashion. The rig and all accessories should be arranged so that they are comfortable to operate over a long period of time.

"I know I will get a lot of flack on this one!" I suggest a soft comfortable chair for the operating position. A soft chair will let your body relax between battles and your mind will be more alert.

The down side of this, according to some experts, is the fact that a soft chair will put you to sleep in many cases. Consequently they recommend a hard straight back chair. Try them both and decide for yourself.

Rest

If you are an Ironman (or Ironwoman), your body may be able to do without its fair ration of sleep. However, most of us need some shut-eye every twenty four hours. In the case of a multi-operator station, it is easy to plan individual rest periods. The single operator is going to have a more difficult time of it, though.

The best way for the single op to plan his rest period is by using the propagation forecast to determine when the slack periods will occur on the band or bands he is working.

For example, on 80 meters the band will be great for DX during the hours of dark, but after sunrise the band dies for long distance. Consider 10 or 15 meters and we have the opposite situation and conditions will be poorer during the hours of darkness.

Of course there will be times when we must leave the rig to answer nature's call. All one can do in this instance is to locate the rig near (or in) the bathroom.

Fuel

Fuel in the form of food and drink is required to keep the contest machine in top form throughout the entire period. My personal choice for keeping the inner op happy is to have someone bring me food and drink at regular periods; but some folks like to get up and stretch and make a sandwich every few hours. Others prefer to have a supply of goodies handy in a small fridge or cooler right at the operating position.

OK, now go win a contest!

Propagation Forecasting

Earlier I mentioned forecasting propagation conditions on your home computer. There are several great programs for doing this on the market today.

There are at least four available for the IBM PC and clones. The first is a public domain program called "MUF" (propagation forecasting for the amateur). This particular program is available from any of the public domain outlets that you find at every hamfest and cost is usually under two bucks.

My own favorite for the IBM is called "BAND AID" and is available from Base (2) Systems, 2534 Nebraska St., Saginaw, MI 48601. I like this particular program because it is easy to use and has an extensive data base included with it.

Base (2) produces several other propagation programs for the IBM, one program plots a map on the screen and shows in three different colors the bands that are open to various parts of the world at a given time (10, 15, 20 meters only).

In addition Base (2) produces a program for both the Apple and Commodore series of computers called "MUF PLOT."

Please note: All of the Base (2) programs are considerably more than the two bucks mentioned previously for the public domain program; remember though, they will do a whole lot more for you than the simpler program. Write to Base (2) for latest prices and info.

To use any of these programs you need to enter your location (latitude and longitude) into the program at the appropriate place. Then obtain Solar Flux info from either station WWV (at 18 minutes past the hour), W1AW during their regular daily bulletins or from NOAA in Boulder, Colorado.

Insert the flux data when requested by the program. Then tell the computer what country you are interested in working. In a few minutes (or seconds depending on machine and program) it will print out in tabular form or graph the MUF (maximum usable frequency), HPF (highest possible frequency), FOT (frequency of optimum transmission) and the LUF (lowest usable frequency).

All of the abovementioned programs (except the public domain one) come with complete instructions that will tell you exactly what the program can and can't do. And how to use the information you obtain.

In my own case accuracy has been within 98%. Another factor that must be considered when doing your own predictions is the K index. This index indicates the state of the ionosphere. A low number (under 10) indicates excellent conditions; higher numbers are an indication of disturbed conditions and tells you that a signal may not be audible.

If you own a computer, any of these programs can add a new dimension to your hamming/SWLing pleasure. After using a propagation program for a short time you will soon begin to understand the vagarities that affect the radio spectrum. Try one, you'll love it!

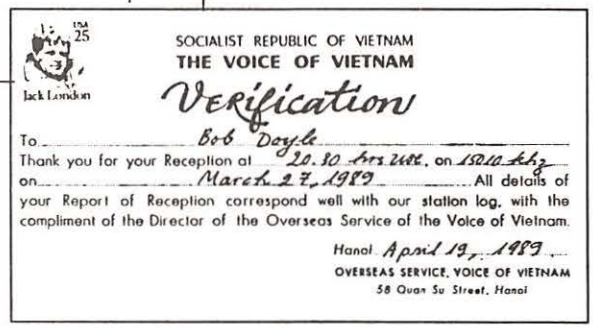
That's all for now gang, see ya next month. 73 - Ike, N3IK

mt

the qsl report

Gayle Van Horn

P.O. Box 1088
Gretna, LA 70053-1088



Bob Doyle of Shelton, Connecticut, received this verification in 58 days from the Voice of Vietnam.

Atlantic Coast

NNONCJ, (MARS) USCGC Eagle (sailing barque), 14933 kHz USB. Full data prepared form card with seal and stamp. Received in 19 days for an English utility report, a souvenir postcard, and a stamped return envelope. Station address: c/o US Coast Guard Academy, New London, CT 06320. (Rick Albright, Merced, CA)

Cyprus

Cyprus Broadcasting Corp., 7205 kHz. Full data QSL card of Cyprus culture, and "CyBc" sticker. Verification signer illegible. Received in 23 days for an English reception report. Station address: P.O. Box 4824, Nicosia, Cyprus. (Robert Landau, Secaucus, NJ)

Libya

SAT, Tripoli Marine Radio, 8515.9 kHz CW. Full data prepared form card with call sign stamp. Verification signer, Ali Mohammed. Received in 70 days for an English utility report, a souvenir post card, and one U.S. dollar for postage. (Rick Albright, Merced, CA)

Mexico

Radio Educacion (XEPPM), 6185 kHz. Full data letter and color studio photograph. Verification signer, Ing. Gustavo Carreno Lopez, Subdirector Tecnico. Received in 32 days for a Spanish reception report and two IRCs. Station address: Direccion General de Radio Educacion, Angel Urraza 622, Caixa Postal 03100, Mexico 12 Districto Federal, Mexico. (Robert Landau, Secaucus, NJ)

Micronesia

NNONLK, (MARS), Kosrae Island, 14478 kHz USB. No data prepared form card with address stamp. Received in 40 days for an English utility report, a souvenir postcard, and one U.S. dollar for postage. Station address: Civic Action Team, Lelu, Kosrae, East Caroline Islands, Micronesia 96944. (Rick Albrigt, Merced, CA)

Pacific Coast

4XII, SS Zim Keelung (Israeli container ship), 12336 kHz USB. Full data prepared form card with call sign stamp. Verification signer Chami Rahav, Radio Officer. Received in 20 days for an English utility report, a souvenir postcard, and a stamped return envelope. Station address: c/o Zim American-Israeli Shipping Line, 150 Fourth St., San Francisco, CA 94103. (Rick Albright, Merced, CA)

South Africa

ZRQ, South African Naval Radio, 8471 kHz CW. Full data multi-colored map-type QSL card. Verification signer, Freeman, Warrant Officer First Class. Received in 470 kHz days (!), for an English reception report, a souvenir post card, and two IRCs. Station address: NAVCOMCEN Cape, Private Bag, Simonstown, South Africa. (Rick Albright, Merced, CA)

Indonesia

Java-Radio Republik-Surabaya, 3975 kHz. Full data personal letter. Verification signer, Mr. Budihardjo. Received in 33 days after the third Indonesian reception report and one U.S. dollar. Station address: Departemen Penerangan RI., Stasian RRI Regional 1 Surabaya, Kotak Pos 239, Surabaya, Java, Republic of Indonesia. (Richard Coday, Oildale, CA)

Lesser Sunda Islands-Radio Republik-Mataram, 3223 kHz. Full data personal letter. Verification signer, Mr. Soekino. Also received a travel brochure for West Nusa Tenggara and a program schedule. Received in 27 days for an Indonesian reception report and one U.S. dollar. Station address: RRI Stasiun Regional I Mataram, JI. Langko No. 83 Ampenan 83114, Lombok, Nusa Tenggara Barat, Republic of Indonesia. (Richard Coday, Oildale, CA)

Monaco

Trans World Radio, 7105 kHz. Full data globe/station logo card, without verification signer. Received in 17 days for an English reception report. Station address: Boite Postal 349, Monte Carlo 98007, Monaco. (Robert Landau, Secaucus, NJ)

Papua New Guinea

New Guinea-Radio Morobe, 3220 kHz. Full data personal letter. Verification signer, A.R. Nase, Station Manager. Received in 22 days for an English reception report and one U.S. dollar. Station address: P.O. Box 1262, Lae, Papua New Guinea. (Richard Coday, Oildale, CA)

Romania

Radio Bucharest, 17860 kHz. Full data Folk Costumes card, without verification signer. Received in 49 days for an English reception report. Station address: Str. Nuferilor 60-62, 79756 Bucuresti, Rep. Socialista Romania. (Nick Terrence, Huntington, NY)

South Africa

Radio Orion, 4810 kHz. Partial data color QSL card of the SABC transmitting towers, without verification signer. Separate letter of verification signed by Helena Boshoff in 65 days for an English reception report. Station address: P.O. Box 91312, Auckland Park, 2006 Johannesburg, Rep. of South Africa. (Bob Doyle, Shelton, CT)

Radio RSA, 21590/9615 kHz. Full data Golden Gate Highland National Park, without verification signer. Program schedule also enclosed. Received in 47 days for an English reception report and two IRCs. Station address: (new address) P.O. Box 91313, Auckland Park, Johannesburg 2006, Rep. of South Africa. (John Carson, Norman, OK) Welcome to the column, John! Thanks also to new contributor Robert Thomas, Bridgeport, CT for the new RSA address.-ed.

Sweden

Radio Sweden, 21610 kHz. Full data Sweden Calling DXers Anniversary Card, without verification signer. Received in 41 days for an English reception report. Station address: S-105 10 Stockholm, Sweden. (John Carson, Norman, OK)

Syrian Arab Republic

Radio Damascus, 12085 kHz. Full data station logo card, and paper Syrian flag pennant, without verification signer. Received in 485 days via registered mail, for an English reception report. Station address: Ommayad Square, Damascus. (Harold Frodge, Midland, MI) (Donald Myra, Brooklyn, NY)

United Arab Emirates

Voice of the UAE-Abu Dhabi, 11965 kHz. Partial data QSL folder card. Verification signer, Ahmed A. Shouly, Controller. Received in 18 days for an English reception report. Station address: Ministry of Culture, UAE Radio, P.O. Box 63, Abu Dhabi. (Robert Landau, Secaucus, NJ) (Bob Doyle, Shelton, CT)

United States

WWV National Bureau of Standards, 15000 kHz. Full data QSL card, without verification signer. Received in 10 days for an English reception report and a stamped self-addressed envelope. Station address: 2000 East Count Road 58, Fort Collins, CO) 80524-9499. (David W. Fields, Louisville, KY)

USSR

Estonia SSR. Radio Tallin, 5925/7100 kHz. Full data card drawn by Sherry Lynn Biedrzychi of Milwaukee, WI, without verification signer. Received in 54/189 days for an English reception report. Station address: Eesti Raadio, 200100 Tallinn, Estonian SSR. (Nick Grace, Harvard, MA) (Carl Radtke, Santa Ana, CA)

Lithuanian SSR. Radio Vilnius, 7400/7165 kHz. Full data QSL folder card with personal letter. Verification signer, Edvinas Butkus, Deputy Chief Editor. Station stickers also enclosed. Received in 99/147 days for an English reception report and one IRC. Station address: Lietuvos Radijas, Konarskio 49, Vilnius, Lithuanian SSR, 232674 USSR. (Fraser Bonnett, Kettering, OH) (John Delisle, N. Palm Beach, FL)

Vietnam

The Voice of Vietnam, 15010 kHz. Partial data color station logo, without verification signer. Received in 58 days for an English reception report. Station address: 58 Quan Su Street, Hanoi, Socialist Rep. of Vietnam. (Bob Doyle, Shelton, CT) (Robert Landau, Secaucus, NJ)

Jack Albert

203 York Place
New Lenox, IL 60451

Codes and Ciphers

In the world of espionage, codes and ciphers are used extensively. Numbers stations are heard just about anywhere on the SW bands. Encrypted RTTY produces random characters on your printer and trying to read the mumbo jumbo can inflict boredom. This can cause anyone to "pull the switch" and turn on the "one-eyed monster" in order to catch the last ten minutes of Mork and Mindy. But don't fret! There is hope.

Why don't you try something new like cracking the code? Two months ago I reported the story about cracking the British Piccolo system. If you have an interest in codes and ciphers, you can do something similar. It takes the proper equipment like a computer or a modem like the M-6000 or M-7000.

In the early eighties, I used a little computer that was similar to the Timex Sinclair. I bought it on sale at Radio Shack. It was called the TRS 80 Micro Computer and it was small enough to fit into a spy's brief case. The computer sold for $119.95 (the close-out price was $50) and it was a fast little bugger.

I wrote a simple Basic program that simulated a databit analyzer (below). My homebred FSK decoder connected to the computer's cassette port and a whole new world was open to me because I was able to examine the serial bits that are sent during an RTTY transmission. The bits were displayed as alternating numbers on a TV monitor.

I learned that some hobbyists, using similar computers, were doing the same thing. They were able to discover TDM and other modes which led to the development of the Info-tech M-6000 and the Universal M-7000.

Others, according to rumors, are forming a clandestine hobbyists' group called "The Code Busters." (I suppose they wear tee shirts that have random numbers with a red circle and a slash bar.) They are devoted to the unscrambling and decryption of coded signals.

Using computers and complicated mathematical formulas, this "watch-dog" group is currently working on cracking the Russian RTTY system and hopes to complete the project by the end of the year. Other projects include the Canadian's VLF RTTY and the mysterious MSK.

With today's sophisticated computer modems, anyone can enter into the world of espionage and intrigue. The M-7000, for example, has a "Databit" mode which will allow you to examine any FSK signal that is found on the SW bands. For some people, this mode is a mystery, but don't let it intimidate you. By fiddling with the buttons, you can become a 007 in the privacy of your own home.

Even this entry-level computer is capable of busting open the mysterious world of encoded transmissions.

If you own an M-7000, tune in any normal RTTY signal such as DHJ51 on 13525 kHz. They normally run 100 baud using 425 Hz shift and send an RY test message. Make sure you are copying readable text and that the DATA ERROR light isn't blinking. (You can also do this on the Info-tech M-6000.)

Now flip the KEYBOARD ALT/NORM switch to ALT and press the left "A" button. You will see a group of five zeros and ones. The bits represent the data that is sent and 01010, 10101 are the codes for "R" and "Y."

When you are not in databit mode, the zeros and ones are converted to a character and displayed on the screen. But isn't it meaningless if the characters are random. You need to examine each bit. Notice that the status line shows ASYNC.

RTTY is referred to as an asynchronous mode because it uses extra bits called start and stop. They are used to indicate the start and end of the character. This allows the equipment to synchronize to the character and determine when the next one will be sent.

But why are there only five bits shown on the M-7000? It uses the start and stop bits but the inventor decided to display only the bits that correspond to the data in order to simplify the screen. I will talk about the SYNC DATABIT mode in a future issue but for now, practice using the ASYNC mode and examine the display.

Get a copy of the *Amateur Radio Handbook* and see if you can decode the zeros and ones by looking up the BAUDOT conversion chart in the Digital Communications section. All of this may sound complicated, but if you use the data bit mode and start experimenting, you will get the hang of it. The PROS do it and so can you!

Does *"Glasnost"* Mean RTTY in the Clear?

Without the help of the Codebusters, I did some databit analysis myself. The Russian RTTY system that I mentioned earlier uses a mode that involves the sending of a constant shift during what I believe is the standby mode. When they go into traffic, they change the baud rate and the data appears to be random.

I even copied them a few months ago in the lower portion of the 20 meter Ham band on 14.080 and, just the other day, on 14.170. I also heard Amateurs express their discontent over what they thought was another Amateur RTTY station that was operating in the Advanced voice portion of the band.

Here are some loggings that I compiled:

Russian (constant shift) RTTY

5.807, 9.417, 9.783, 9.987, 10.270, 12.022, 12.058, 12.794, 14.080, 14.170, 14.316, 14.356, 14.770, 14.997, 15.658, 15.663, 18.289, 20.325, 20.735, 22.806

If you have any information on Russian RTTY, drop me a line or send in your loggings.

NNN

BASIC Program for the Radio Shack Micro Color Computer

```
1000 ST = 16384 : ED = 16895     REM set screen limits
1010 For B = ST to ED: A = Peek (3): Poke, A: Next: Goto 1010
```

Note: Because of the way the Tandy Micro Computer handles the screen memory, the above program may not work on all computers.

Ken Reitz, KC4GQA

Route 5, Box 156A
Louisa, VA 23093

Back to School

Whenever a new technology comes upon the horizon, proponents are quick to list among its benefits that of educating the general public.

There is no better example of this than that of cable and satellite television. "In the future," sages of an earlier time would predict, "there will be special channels dispensing education. The knowledge-thirsty consumer with a yen for Japanese, for example, would receive expert instruction from a master of the language."

The cable converter box or satellite dish would become a cornucopia of learning. We could learn to play the violin or lay brick through the miracle of video instruction.

Promises on Hold

Satellite delivered education remains a viable proposition particularly for those in areas which are not and will likely never be serviced by cable.

However, as one scans the Clarke Belt and views the 158 video channels currently in use, only a dozen or so channels are noted which can be loosely described as educational (See accompanying chart.)

Those of us who have seen the collapse of other good ideas: solar power, syn-fuels, CB radio, to name but a few, are not surprised by this industry's inability to deliver the goods.

The primary reason for the entire broadcast industry's existence is to make money for its many shareholders. They've achieved this by the warehouseful.

Only after the shareholders have supped their fill at the trough is there something left for education. It is dispensed in thimbles.

Commercial network execs would, of course, be quick to challenge this analysis. "We only give the public what they want," they bleat. "You want us to replace 'She's the Sheriff' with 'Wall Street Week'? Gimme a break."

Chart for Sky Schools

Sat	Chan	Service
G2	2	UVA Telecourses
G2	5	VTU Telecourses
G3	11	Mind Extension University
W4	Several	High School Telecourses
W5	Several	Occasional College Telecourses
T3	24	SCOLA
F3	2	Learning Channel
G1	22	Discovery Channel

Exceptions to the Rule

Needless to say, the full potential of learning via satellite remains in the future but what there is of it in the present is worth looking into.

If there were to be one pot at the end of the Clarke Belt rainbow, it would have to be Westar 4. If your actuator were to permanently freeze while the dish was staring at W4, you could do worse.

Here reside the four schedules of the national PBS network. There are more programs on those four channels with more variety for a week's viewing than anyone could watch in a week.

From the usual nighttime fare of "Austin City Limits" and "Great Performances" to the politics of "Firing Line" and "America's Defense Monitor," PBS is entertaining.

From the daytime viewing of how-to courses on art, woodworking, Spanish, and fitness, to high school courses on civics, history, and math, PBS is teaching. A lot of the programming seen here isn't available on your local PBS outlet.

"Higher" Education

The satellites at 23,000 miles above the planet give an entirely new meaning to the phrase "higher education." College level courses are to be found as well. The University of Virginia and Virginia Tech both have transponders aboard Galaxy 2. Emphasis here is on third and fourth year as well as post-graduate level courses on science, engineering, mathematics, and architecture.

Other college level courses may be occasionally found on Westar 5. I've noted sociology courses from Iowa here.

Channel 11 of Galaxy 3 is the site for the "Mind Extension University" which is a noncommercial service offering an entire catalog of courses from beginning French to aerodynamics engineering. College credits for these courses are offered through Colorado State University. There is even a toll free number for students to register.

One of the more intriguing channels is SCOLA. The Satellite Communications for Learning, based at Creighton University, uses its extensive dish farm to gather news broadcasts via satellite from around the world. These newscasts are taped and rebroadcast on schedule via their service on Telstar 303 channel 24. The programs run without interruption, dubbing or subtitling in their native languages.

SCOLA billboard shows an extensive dish farm for service of Creighton University uplinked via Telstar 303 Channel 24.

Aimed at the nation's language, political science, and journalism schools, SCOLA gives students an inside look at politics, journalism, and language in everyday use from every corner of the globe. Occasionally one will see panel programs featuring various professors discussing recently aired newscasts. It's top-notch analysis and a must for the true news hound.

You might want to catch it while you can. Trade sources report that SCOLA is considering scrambling its signal. It seems the service operates on the honor system and asks that institutions using the service pay a yearly fee. Incredible as it may seem, some colleges and universities aren't paying. Honor in America has hit a new low.

Learning and Discovery

Two other satellite channels are worthy of note in the field of home learning. They are the Learning Channel (F3 2) and the Discovery Channel (G1 22). These commercially operated services also enjoy the widest distribution. Seen on many cable systems around the country, they are among the few examples to which a cable operator may point to and shrug off "wasteland" accusations.

Look here for reruns of old PBS series and British nature shows. Old documentaries such as CBS' "World At War" are of interest here as well.

International Report

Jim Newman, a *Monitoring Times* reader on the island of Grenada, reports on TVRO

activities there: "People here get Galaxy 1 at 8 degrees off the horizon quite well and about one half to two thirds of the domestic U.S. satellites...using 16 foot dishes." In addition, he says, PanAmSat has a very strong signal there. It is, however, an expensive proposition as Jim reports the import tax on a TVRO system is 85 percent.

Graham Evans, G0HDC of Shropshire County, England, has recently installed a Sky Channel TVRO system at his home. He was kind enough to send a local *Satellite Guide* which shows the impact of American Cable programming on this new British Ku band DBS service.

The Disney Channel, The Discovery Channel, Bravo, and CNN are among the fare beamed to British backyards via Rupert Murdoch's Astra bird. Prices for "nonsteerable" dishes range from 200 pounds to 1000 pounds. Consumers may expect a 100 pound installation fee and decoders are extra.

The Sky Channel Direct Broadcast Service has lagged behind predicted sales. The undaunted Murdoch appears prepared to sink as much as 800 million dollars more into the project.

While the signals are presently unscrambled, plans call for encryption by later this year. Reports indicate that Sky will give the decoders to subscribers thus neatly sidestepping the public outrage experienced by American dish owners who were forced to purchase 400 dollar descramblers in addition to subscription fees.

Transponder Notes

C-SAT is a TVRO talk show located at 6.80 MHz audio subcarrier of S3 9. It was founded in early May of this year following the demise of Chuck Dawson's K-SAT. At 7:30 p.m. ET, C-SAT presents a very useful and timely report of current TVRO news. It is really the only place where daily developments in the satellite TV industry can be heard strictly from the noncable perspective.

RFD-TV in Trouble

Ten months after its inauguration, RFD-TV left the air (S1 23) following reports of financial difficulties. Ten days later, the service resurfaced on W5 17 in a marathon fund-raising mode. Viewers were urged to call a toll-free number to join the RFD-TV "Booster Club."

The agriculturally related service has proven how difficult it is for a new full time satellite service to keep up the payments. It's a commentary on our society that 24 hour per day shopping channels not only prosper but appear to reproduce while RFD-TV struggles.

More FM Subcarriers

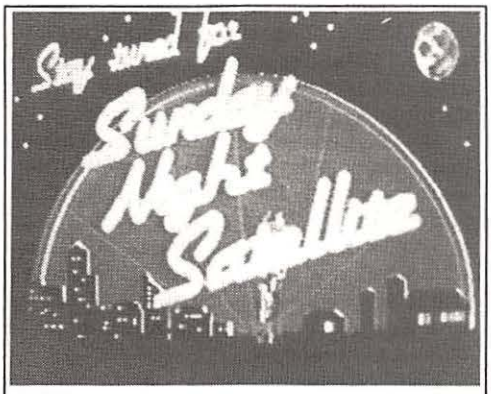
A number of FM audio subcarriers are being uplinked on F4-19. The commercial free music formats are riding the video carrier of a set of standard color bars.

More on Sunday Nite Satellite

Riding a wave of popularity or at least gambling with someone else's money, Sunday Nite Satellite has added a Thursday night version. Found on W5-1, both shows feature TVRO industry news, reports of channel and satellite changes and reviews of products and movies.

AFRTS Scrambles

Without fanfare AFRTS has scrambled its service on F2-22. Using the unbelievably flimsy excuse that since some of its program content (most notably CNN) is originally scrambled and that the entirely taxpayer funded service is intended solely for the totally taxpayer paid service personnel in Europe, it is not meant for domestic reception. Are these people answerable to anyone?



Billboard for Sunday Night Satellite now on Thursdays as well. Look for SNS on W5-1 at 9:00 p.m. ET.

Watching the VOA

Meanwhile, next door on S2-21 dwells the USIA which feeds live its VOA radio broadcasts. Often a camera is set up in the studio and viewers may watch the announcer deliver the news.

Ghost of SelectTV

In a story which has as many twists as a good mystery novel, reports persist that SelectTV will return to the air. It's a complicated story that's not worth repeating because, as with the much rumored return of the Caribbean Superstation (CSS), I'll believe it when I see it.

Another Zoning Law Found Illegal

An article in *Satellite Business News* (June 1989) reports that "Zoning regulations requiring satellite dishes in Nutley, New Jersey, to be installed behind seven-foot-high hedges in backyards have been declared illegal by a state superior court."

To my knowledge, municipalities have yet to win a court case at appeal levels or higher involving challenges to local zoning restrictions. The laws, usually written by and for the benefit of local cable monopolies, have proven unable to withstand the scrutiny which comes from impartial legal judgment.

Karl Zuk

P.O. Box 98
Brasstown, NC 28902

If you build it ... they will come!"

"I like to play a little game with my wife," says Leonard Kahn. "After a long day, she will nod off as we drive home. The car radio will be playing WQXR, a classical station in New York City. They broadcast the same programming on FM and AM in stereo.

"I'll switch from AM to FM, and within a minute or two, Ruth will say, 'What's wrong with the radio?' She'll hear the FM multipath and 'picket-fencing' as we move along. That really proves my point. People listen to the radio in their cars, and that's where AM is clearly superior."

Synonymous with the term "AM," Kahn is a gentle man. He speaks quietly with authority and experience. He believes in himself and he believes in the future of AM radio. Kahn works endlessly, with his wife, Ruth, and several other people, in a modest office and laboratory in Westbury, Long Island, New York. He loves his work, and the future of AM radio may be in his hands.

Kahn designed one of the two surviving systems for transmitting AM stereo. The other system is being promoted by Motorola, the two-way radio giant. Nearly 5,000 AM radio stations operate in the United States alone, and the competition to become the standard AM stereo system has been fierce. Both Magnavox and Harris have conceded defeat so far. The two survivors are now vying for control.

Although many broadcasters already consider Motorola the winner, Kahn insists that the race isn't over yet. He contends that the reason the Motorola system is currently dominant is not because of technical excellence. Motorola has strong connections with General Motors, Ford, and Chrysler, and has convinced "The Big Three" to manufacture radios that only receive Motorola's stereo and not Kahn's.

America's broadcasters want to use an AM stereo system that the public can receive. Quite a few have chosen Motorola stereo for that reason alone. Kahn believes that Motorola has created an unfair marketplace and is currently fighting an anti-trust battle against them in court.

Kahn wants the right to compete fairly much more than being awarded damages by a court. "My system is technically correct, and if the marketplace is free, AM will survive. It's better than FM stereo. The competition is not Motorola. Motorola has the receivers and the broadcasters, and their sales have gone flat. Motorola's problem is Motorola's system, not me. AM must compete with FM stereo. AM has to have superior technology to survive." claims Kahn.

Leonard Kahn with his latest invention, an AM stereo cylinder tuner.

"You also have to support clear channels because AM's great advantage is long distance and mobile reception. If you've ever taken a long drive, you know how frustrating it is to constantly change FM frequencies for good reception."

The major shortfall of the Motorola system is a problem called "platform motion." When an AM station broadcasts at night, and the slightest signal is received from another distant station, the stereo channels seem to flip-flop from one side to another causing quite a dizzying effect. You no longer listen to a turntable, you feel like you are on one! Kahn's system is immune to this effect, and this problem makes the Motorola system almost useless for distant or mobile use.

Leonard Kahn's AM stereo system is only one of many things he has designed to revive the AM band. To pack more modulation into a signal, Kahn designed the "Good 'n' Loud" processor which can add loudness without distortion for greater reception range.

His "Flatterer" is an intelligent equalizer that manipulates an AM transmitter and antenna system for higher fidelity. "The Secret" converts Motorola AM stereo radios to receive Kahn stereo as well. Just being introduced is a small cylinder-shaped tuner that receives one station in flawless stereo. It is designed as a promotion device, or as a radio station monitor.

Kahn Communication's most popular product is called "Power-Side." It converts AM transmitters to a half-way compromise between conventional AM and single sideband. By putting most of a station's sound into one sideband, its signal becomes more penetrating. Other stations broadcasting on the same, or nearby, frequencies can be tuned out for better reception.

For example, there are stations in New York City and Syracuse, New York, on the same frequency: 570 kHz. At night, a great portion of their audience would hear both stations and tune away from the unlistenable sound.

Now that these stations have installed "Power-Side," they have increased their coverage greatly. WMCA, in New York City, favors the higher sideband, and WSYR, in Syracuse, New York, favors the lower. It's almost as if they operated on two separate frequencies.

Kahn's interests are not limited to AM radio. His firm has also worked on GTE's Airphone system, making phone calls from airplanes a reality. Kahn Communications is also involved in a joint venture with Bonneville Communications of Salt Lake City. Using a phase-shift design, slow-speed data can now be sent along with an AM radio signal. This system has been tested, with great success, at radio station KSL in Salt Lake City.

"We have to reach today's youth with our technology to continue AM radio into the future," Kahn claims. "You need good receiver designs. Superior programming won't do it. Young people need to see an obvious difference of high quality sound."

To many, AM radio is in the bottom of the ninth, with two men out. To Leonard Kahn, the game has just begun, and he's in his field of dreams.

Bits and Pieces

Creativity is a very important part in marketing AM radio stations these days. If you don't sell advertising, you'll quickly be out

Kahn Communications in Westbury, Long Island -- trying to save an industry.

of business. WJJF, 1180 AM, in Hope Valley, Rhode Island, is hopeful in its new angle to sell time. They do it with magazine and newspaper ads!

They call their campaign "Mail-order, multi-level, impact radio advertising," and they offer time for as little as $3.48 per minute. By filling out a form and mailing it in, you can order advertising, script writing, and production services, and even a toll-free number to receive all those listener inquiries that will come pouring in!

Comedy has become a major factor in broadcasting, especially for morning drive-time programs. To help their affiliates gain a leading edge, many radio networks are now providing a daily, closed-circuit service of comedy clips to their stations, as added ammunition against the competition.

"ABC Morning Show Prep," "CBS Morning Circus," "The Premiere Comedy Network," "The Rock Comedy Network," and "The Contemporary Comedy Network" are only a sample of the many programs fed by satellite each morning, filled with production aides, jingles, and lots of laughs, to lighten up your listening on the way to work.

Although they were near bankruptcy in 1983, National Public Radio is back in a garden of roses. In the past five years, their listenership has doubled, and their income, through charitable contributions, has increased four-fold. NPR now boasts 365 affiliates nationwide.

Mailbag

Arnold Lawton, of Chambersburg, Pennsylvania, sends us news that his local station, WCBG, atop Radio Hill in his hometown, has closed its doors after 33 years on the air. The station had been operating on 1590 kHz AM and fell upon hard times. The station's ad sales were only about half of what they were last year, and the owners decided there was no hope for success.

The station recently had been changed to an all-talk format, with former WMAR-FM Baltimore's Pete Michaels as morning host. "We tried to make a very professional radio station," said WCBG owner W. Ronald Smith, "but being a stand-alone AM, with no FM companion station, was a marked disadvantage."

And if you are blind and living on Cape Cod, there is a station just for you. D. Edis of Dennis Port, Massachusetts, sends us an item about the Talking Information Center. A high school English teacher, Ron Bersani, is also the executive director of the TIC program.

Broadcasting one hour a day on a subcarrier of WFAL-FM in Falmouth, the service brings a calendar of events, shopping guides, in-depth news concerning the blind, and a spoken-word book reading show. Bersani has funded the project with a grant from the Massachusetts Commission For the Blind.

Even though a special radio is needed to receive the service, the listenership continues to grow. Most listeners find the station by word-of-mouth. "I'll be just talking to someone and they'd say 'Oh, I know a blind guy,' and before you know it, we have another listener," Bersani says.

Be an American BandScan Reporter. See any stories about radio in the local paper? Send them to Monitoring Times, P.O. Box 98, Brasstown, NC 28902.

New Station Grants

More stations are coming on the air every day, and here are the latest grants for operation by the FCC, as reported by the M Street Journal: Montgomery, Alabama, 96.1; Mariposa, California, 103.9; Aspen, Colorado, 107.1, Fort Walton Beach, Florida, 96.5; Blackfoot, Idaho, 101.5; McCall, Idaho, 101.1; Coushatta, Louisiana, 92.3; Cleveland, Mississippi, 107.7, Saranac Lake, New York, 90.5; Watertown, New York, 91.7; Tioga, Pennsylvania, 93.3; Tunkhannock, Pennsylvania, 107.7, Patillas, Puerto Rico, 610; Killeen, Texas, 92.3; and Bellingham, Washington, 91.7.

For Sale

There's an FM in Augusta, Maine, for sale this month. It features an excellent market of over 65,000 people, and an "amazing" signal, with a transmitter location almost 1,000 feet high. The owner is asking $295,000 in cash. Contact D. Tallyn, 300 North Fig Tree Lane, Plantation, Florida 33317.

If you like skiing, you'll love this one. Only $50,000 to enter a joint venture on a Class A FM in Montana. Write to M. Gottesman, P.O. Box 761, Laramie, Wyoming 82070.

A construction permit for a full-time AM station is on the block. Authorized for 5 kW directional days and 500 watts directional nights, it's in country that is adjacent to a top 50 market. There's also a possibility of upgrading the station to 50 kW. Write to P.O. Box 40333, Nashville, Tennessee 37220.

Also in the Volunteer State is an AM station on 1580 kHz, with a new office and studio at the transmitter site. A satellite system is included. Asking $200,000 in cash. Write to A. Wilkerson, WLIL, P.O. Box 340, Lenoir City, Tennessee 37771 or call 615-986-7561.

International Bandscan

Independent stations continue to flourish in Great Britain. Classic Gold is a new AM service that will be heard on The Yorkshire Radio Network on 990, 1161, 1278, 1305, 1530, and 1548 kHz. In the Southhampton area, Ocean Sound currently operates four services: Power FM on 103.2, Light FM on 96.7, Ocean Sound on 97.5, and the Gold AM on 1170 and 1557 kHz AM. And while you're in the area, The Isle of Wight's AM community franchise has been awarded to two Ocean Sound employees, who hope to have it on the air by next month. With a staff of 16, they will broadcast 24 hours a day, probably calling themselves "IW Radio."

The Home Office of the DTI (the British version of the FCC) has unveiled a plan to assign newly created community broadcasters with temporary authorizations for 100 watt AM transmitters. This will allow 300 to 500 stations to begin broadcasting to limited local areas in 1991. These stations will be transferred to FM in the mid-1990s.

The Australian Broadcasting Commission has announced a new computer bulletin board service called "Matilda." You can waltz up to this service by dialing 011-61-3- 894-1517 from the U.S., with baud rates of 300, 1200, or 2400.

In Costa Rica, Radio Impacto is now broadcasting on 980 kHz, and the Voice of America has closed its Ciudad Quesada relay station on 930 kHz. Radio Costa Rica will continue on 930 kHz, with low power, from its San Jose transmitter site.

Century Communications, in Tullamore, Ireland, has been licensed for a 100 kW national commercial station on 891 kHz. Deutschlandfunk, in West Berlin, has a new service on 810 kHz, now on 24 hours a day.

Coming up next month: details about how to start and run your own FM radio station... so stay tuned! Please write me with your comments, questions, news and views! We'd love to hear from you. Write to: American Bandscan, c/o Monitoring Times, P.O. Box 98, Brasstown, NC 28902.

mt

Credits:

Our thanks to Broadcasting, Radio World, and Company magazines, The M Street Journal, to readers F.W. Cleeson, D. Edis, Malcolm Kaufman, and Arnold Lawton, and to the British DX Club for their contributions.

Dr. John Santosuosso

P.O. Box 1116
Highland City, FL 33846

Radio Resuscitations

LA VOZ DE ALPHA 66 UPDATE: The details of the FCC's closing of anti-Castro Voice of Alpha 66 can be found in the July issue of *MT*. Since then, additional matters have come to light.

We were first advised that Commandante David's Radio Libertad Cubana had also been raided, but that turned out to be erroneous. A reliable south Florida source claims to have heard both the Commandante and Alpha 66 since the late May shut down took place.

However, attempts to monitor Alpha 66 on its past frequency of 6666.6 kHz have produced no results here. We cannot confirm that the station has indeed resumed broadcasting, but that possibility should not be ruled out either.

A spokesman for Alpha 66 has stated the organization does intend to continue its radio transmissions but will seek a site outside the United States. In the past, Alpha 66 has managed to return within a relatively brief period of time after unpleasant encounters with the FCC. What their success will be this time remains to be seen.

We have also been told that the Alpha 66 raid should not be taken as a major departure from past Washington policy in regard to Cuban exile broadcasting. From time to time some steps may be taken to keep the Castro regime from getting too upset. However, the Bush administration does not want to alienate the Cuban-American vote either.

It probably would prefer that the exiles take their broadcasts "offshore" in the manner of La Voz del CID. That gets the job done without the embarrassment of having clandestine transmissions from American soil.

RADIO CLANDESTINE: A CLARIFICATION: Over the past several months a number of "Outer Limits" readers have reported loggings of this famous old pirate. Recently we were able to make contact with the person who in the past handled all of Radio Clandestine's publicity.

He claims that no new Radio Clandestine broadcasts have been made since very early in 1988. All current Clandestine transmissions are relays of past broadcasts. Radio Clandestine has no objections to them, and in fact seems to favor them, as it helps to keep the station "alive" until it does return. The spokesman did express the hope that Clandestine will return but he gave no timetable for that.

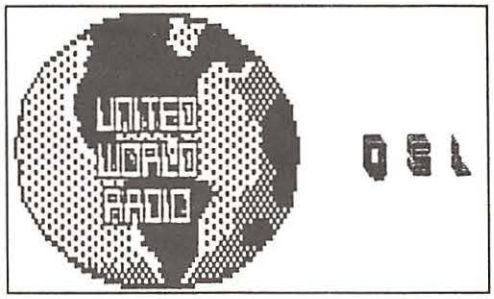
Someone responsible for at least some of the Radio Clandestine relays has been giving an address of Pirate Radio Network, P.O. Box 3114, Kingston, NY 12401. Ohio's Fraser Bonnett writes to say he has been informed the POB may actually be 3134, although at this point he cannot say which is correct. Radio Clandestine's spokesman said he was not aware of this maildrop and knew nothing about it. All mail used to reach the station through the now-closed Battle Creek, Michigan, maildrop.

Meanwhile folks are continuing to hear the Radio Clandestine relays. Fraser came across one on 7415 at 2351. Oklahoma's Mike Reynolds found Radio Clandestine on 7418 at 0400 with such zany stuff as ads for Marijuana Helper and Canned Leftovers. Frequent contributor Pat Murphy wrote to tell us the strongest pirate signal he ever heard was from a recent Radio Clandestine relay.

RADIO MORANIA: We also were able to reach someone who was once involved with Radio Morania. Again, there have been fairly frequent loggings of this one lately, and the Pirate Radio Network address noted above has been announced during Radio Morania transmissions. All such broadcasts are relays. there were only two original Radio Morania programs ever made. There will be no more, and the folks responsible for these never had any mailing address or verified any reception reports. They do not object to the relays. If these shows continue to be enjoyed, then that is fine with them.

AND SPEAKING OF RELAYS: Who is responsible for the antics on 7415? As we have reported in the past, this station has been heard relaying some sort of medical program and also a Portland, Maine mediumwave station. Not long ago Fraser Bonnett and this writer heard what was apparently the same outfit at 0302 relaying a recent tape of licensed Red Rose Radio in Preston, England! Stay tuned to 7415. It could be very interesting.

THE RETURN OF RADIO DUBLIN: Some pirates refuse to die. Despite raids by the Irish authorities, Radio Dublin lives, and on shortwave! It has been logged here on its old frequency of 6910 at 0312 UTC. However, the signal is weaker than in the past. We understand power may now be limited to as little as 40 watts. This one could, of course, disappear again at any time.



Ray Babecki and Pat Murphy are both the proud possessors of a United World Radio QSL.

England's's Paul Kay (of pirate Wrekin Radio) and Ary Boender of the Netherlands give us some further details on the Irish situation. Former Dublin pirate Sunshine Radio went to court to try to get a license. Its case is to be appealed to the Irish Supreme Court and the Court of Human Rights in Holland. And, yes, you sharp-eyed readers, that was the Irish Radio Sunshine, rather than the English station with the same name, whose sticker appeared in our special feature on British pirates.

In addition to shortwave, Radio Dublin is active on both mediumwave and FM. Other pirates still trying to make a go of it include, for now anyway, Premier 212, Northside Radio, WABC, Riverside Radio, TNR, Cix 96, and Radio Star County. WKLR in Bandon, County Cork, was one of the very few luck pirates. It got a license. Several other licenses have also been granted to private, independent stations. However, it is obvious that most of the former pirates are going to be left out in the cold. The number of licenses available is quite limited, and the pirates also have to compete with new organizations seeking to broadcast in Ireland.

FREE RADIO ONE: We are starting to get a good deal of mail in regard to this relatively new pirate. It could turn out to be one of the most controversial since the Voice of Tomorrow came on the scene a few years ago. From Virginia, Silas Cole logged them at 0209 on 7415 kHz. Free Radio One was unhappy with the IRS, homosexuals, and the "Godlessness of modern America." He also heard the station address given as 3434 North Pacific Highway, Medford, OR 97501.

Fraser Bonnett, who is hearing nearly every pirate these days, received a three-page mailing from the station in which it expresses its philosophy and offers various publications for sale.

Free Radio One wants 10,000 underground broadcasters, sympathetic to its views, on the air within three years. It endorses the North America One satellite service (see the article by Ken Reitz in the July *MT*) and Tom

Valentine's Radio Free America call-in program.

Radio Free One's philosophy could be summed up as politically right wing and religiously fundamentalist. It should attract considerable attention and stir up just as much debate. Again, stay tuned.

AND ACROSS THE BANDS:

All sorts of stations are being heard! In Massachusetts, Phyllis Werlin came across one she heard mention Radio Animal on 6240 at 0420. She heard no address, but the station was urging people to "write to free radio and fight for free radio."

It looks as if you found WKND, Phyllis. Steve Rogovich of Virginia has logged that one on several occasions and come across announcers Radio Animal and Big Ed. The address for reports is 3007R 4th Avenue, Beaver Falls, PA 15010.

Pennsylvania's Barry Rowan checks in with a couple of oddities. At 0500 on 1620 he heard something announcing as WNBC New York and giving a frequency of 660 kHz. Whether this was somebody imitating the former NBC mediumwave outlet or a tape is not clear. On 7482 in USB at 2030 he heard a station identifying as Radio NewYork International testing. They also announced the old RNI frequencies of 6240 and 1620. According to somebody very close to the RNI organization, this is almost certainly not the original RNI.

Fred Kohlbrenner of Pennsylvania has several good logs to report. He found "Wideband, Sideband, T.R.S., the Radio Station" on 7424.9 kHz at 2320. Ads featured "Cavalier Air Strikes" and "Recently Stolen Transmissions." He also heard WBRI "The Voice of the Antenna of Liberation in the northern hemisphere" on 7486.8 at 0349. This one featured country music and reggae, a rather unusual combination.

Steve Rogovich is another one of our readers hearing just about everything these days. One of his more unusual logs is WCPR on 7480 at 0030. It was rebroadcasting a religious show, "Saturday Night Alive," which was transmitted originally by WAWZ FM 99 in New Jersey. Among Steve's other logs are Radio Clandestine, Free Radio One, and one for the widely-heard WENJ J-Rock on 7421 kHz.

Ray Babecki writes from New Jersey and Pat Murphy from Virginia to send copies of their QSLs from United World Radio. Nice going, guys, and we are reproducing the UWR QSL with this column.

Finally, for you numbers station chasers, West Virginia's Todd McKown reports English numbers in the xxx xx format at 2332 on 5045 kHz. This is the "dictionary code format." The key to deciphering these messages is to know what dictionary is being used to refer to particular pages and words.

We still have a good deal of excellent European material from Martin Lester and Cathy Turner, but again we will have to hold it until we have a bit more room.

A FINAL NOTE FROM MEONTOLOGICAL RESEARCH RADIO: This station wrote us directly and sent along the copy of their QSL you see reproduced here. They hope "Outer Limits" readers will try to tune them in. Reports can be sent to the Beaver Falls address given above.

Klaus Kinski, programming director for WXZR, promises new and interesting music including avant garde, experimental, new wave, and underground. He also promises a mailbag and even a religious show entitled "God Can Say Cog." And on that note, maybe it is time to say goodbye until next month. Happy listening everybody!

mt

WXZR Meontological Research Radio sends along a sample of the QSL used for all correct reception reports.

Joe Woodlock

P.O. Box 98
Brasstown, NC 28902

The Beacon on Swan Island

Over the years, much has been written about clandestine radio, pirates, and the numbers stations. These all seem to occur in the higher frequencies. But low frequency can have its mysteries, too.

Back in the mid-seventies I DXed beacons along with other utilities such as coastal stations. It became almost traditional for me to report my first logging of the season of SWA on 407 kHz. This beacon was located on Swan Island down in the Gulf of Mexico and, for those of us in the northern part of the middle-west, it was the indication that the winter beacon season was underway.

There was also a kind of mystique to Swan Island. Here was this little group of tiny islands in the western part of the Gulf of Mexico, not too far from Mexico and Central America. An atlas from 1950 showed Swan Island held jointly by the U.S. and Honduras. This was a U.S. beacon on this dot of land, and it was under the FAA.

The first few loggings of Swan Island had been rather exciting. It was a secondary treat to hear the beacon on later dates in the spring or before the fall season actually got underway. But, in general, reception became rather hum-drum, although it did remain a great indicator of winter DX conditions for those of us in the middle of the continent.

Then SWA slipped off into oblivion, quietly. The winter beacon season rolled around and there was no solid SWA on the airwaves; no di-di-dit di-da-dah di-dah to tell us another season of great DXing had returned.

Brief stories appeared here and there. The beacon had been decommissioned. The island had been ceded to Honduras and that it was no longer known as Swan Island -- instead it had become something called Islas del Cisne.

The listing of the Swan Island airport and its facilities no longer appeared in the military flight manual. Swan Island had become a silent ghost of winters past.

A new sound appeared on 407 in June of 1986. This new sound was LAB and was heard by many DXers in different parts of the continent and even in Hawaii. It didn't appear in any of the traditional sources where new beacons usually take their bow. Nor was anyone able to come up with any unusual sources that could identify this new kid on the block.

Using directional antennas and the resultant differences in signal strength could provide some guides to location, particularly when done by DXers in various locations around the country. The indication was that the new beacon was to the south and quite possibly in the Gulf of Mexico. This was reinforced by a report from Hawaii that placed the beacon almost directly east of Hawaii.

An oil platform was one of the first suspected locations. However, the continuous transmissions of the beacon was not the normal pattern for oil platforms. Platform beacons are often turned on only during the period of helicopter traffic to and from the platform.

Next came another break from Hawaii. Long distance reception of low-frequency beacons requires a path of darkness. When either the receiver or transmitter is in daylight, the signal strength begins to diminish.

Because the signal was east of Hawaii, reception in Hawaii would fade as daylight reached the transmitter site. The time of the fade in Hawaii corresponded with sunrise in the western part of the Gulf, just about the place where Swan Island was located. (Oops, Islas del Cisne)

In January 1987 LAB also appeared as a beacon ID on 319 kHz. Some DXers checked 407 just after hearing LAB on 319 and found LAB was on both frequencies. Thus, this was not a move. A DXer, who had two receivers, tuned one to 319 and the other to 407. In this way he determined that the two signals were not synchronous, proof that they were coming from different transmitters.

LAB was only heard for a brief period on 319 and has not been reported since that time. It is unknown whether this was a test for a potential frequency move, a temporary second transmitter, or even related to the LAB on 407.

Next, LAB on 407 became LAB E. When an E is heard after the ID with a short delay, it usually indicates that a secondary transmitter is being used.

Beacon transmitters are often physically at remote locations. The system is automated so that a secondary transmitter is activated if the primary transmitter fails. The trailing E is part of the ID for the secondary transmitter so the operators will know that the primary transmitter is not operating any more. This alerts them to arrange repairs for the primary transmitter.

Whether by design or accident, LAB continued to operate with the secondary transmitter and the ID of LAB E.

A few months later, the military flight manual restored the listing of the Swan Island airport (as Islas del Cisne). It listed the ID of the beacon on 407 as SWA.

It was generally believed that the ID would now be changed back to SWA. But the anticipated switch from LAB to SWA did not occur. One person wrote to the military, pointing out that the manual said the ID was SWA but the actual ID being sent was LAB E.

The response was that this was the responsibility of the Honduran government because the island was their possession. The military would pass the information about improper ID to the proper authorities in Honduras.

Within a couple of weeks, the ID changed from LAB E to SWA. Now the ID was in agreement with the listing in the flight manual. In another unusual twist, the following issue of the military flight manual dropped the Swan Island listing and it hasn't reappeared since that time.

A few months after the change in ID, SWA also began using the trailing E indicating a second transmitter was in use. At last report, the ID has remained SWA E up to the present.

Finally, a recent issue of Linn's Stamp News carried a letter from a collector who is trying to get mail from Swan Island, since the islands were given to Honduras and leased by the United States "for use by U.S. personnel involved in the Contra operation." Letters have gone unanswered but haven't been returned.

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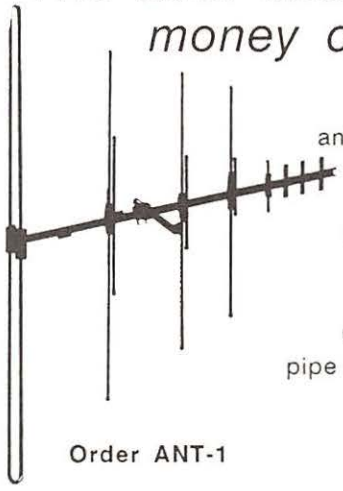

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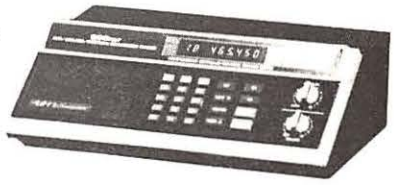

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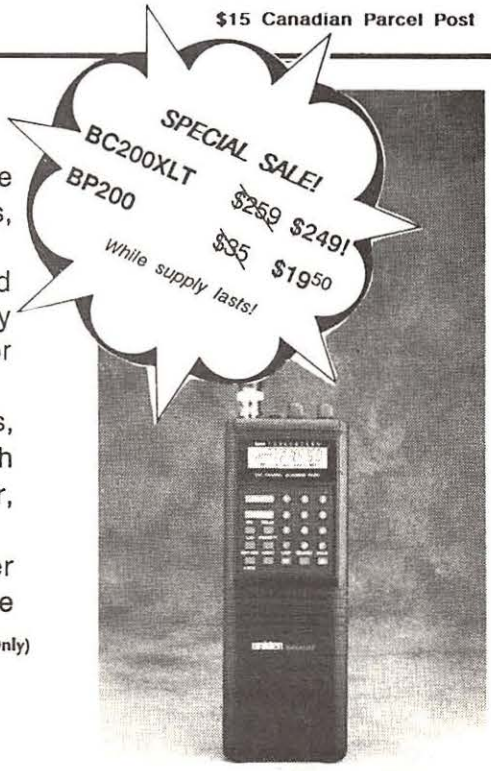

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program guide

Sunday

September 3, 10, 17, 24

0006 Christian Science Monitor: Herald of Christian Science. Religious programming explaining the doctrine of Christian Science.
0030 BBC: Musical Feature. Programming on various musical subjects.
0030 Radio Australia: Anything Goes. John Anderson with a musical smorgasbord.
0101 BBC: Play of the Week. Hour-long drama selections.
0106 Christian Science Monitor: Herald of Christian Science. See S 0006.
0113 Radio Australia: Boomerang. Answers to listener enquiries about Radio Australia.
0130 Radio Australia: At Your Request. Dick Paterson plays listener requests.
0206 Christian Science Monitor: Herald of Christian Science. See S 0006.
0209 BBC: British Press Review. Survey of editorial opinion in the British press.
0215 BBC: Global Concerns. A look at major environmental problems facing the world.
0230 BBC: The Ken Bruce Show. A mix of popular music and entertainment news.
0230 Radio Australia: Communicator. Report on developments in the communications world.
0306 Christian Science Monitor: Herald of Christian Science. See S 0006.

Sarah Johnston, Gariba Bawa and Peggy-Anne Graham present "Mailbag Africa," "Mailbag Asia," and "Mailbag (North America)" on the English Service of Deutsche Welle.

0313 Radio Australia: Music of Radio Australia. Selections by Radio Australia announcers.
0315 BBC: From Our Own Correspondent. In-depth news stories from correspondents worldwide.
0330 BBC: Just a Minute. A game show in which contestants try to present a minute of pure discourse.
0406 Christian Science Monitor: Herald of Christian Science. See S 0006.
0425 Radio Australia: Propagation Report. Mike Bird with the shortwave weather report.
0430 BBC: Stuart Colman's Record Hop. Classic and contemporary rock and roll (except September 17th, 24th: Boys in the Back Room, a look at the people behind the scenes in the theatre).
0430 Radio Australia: Arts Roundabout. Arts in Australia, past and present.
0445 BBC: Personal View. A personal opinion on topical issues in British life.
0506 Christian Science Monitor: Herald of Christian Science. See S 0006.
0509 BBC: Twenty-Four Hours. Analysis of the main news of the day.
0513 Radio Australia: Music of Radio Australia. See S 0313.
0530 BBC: Financial Review. A look back at the financial week.
0530 Radio Australia: At Your Request. See S 0130.
0540 BBC: Words of Faith. People share how their scripture gives meaning to their lives.
0545 BBC: Letter from America. Alistair Cooke's distinctly British view of America.
0606 Christian Science Monitor: Herald of Christian Science. See S 0006.
0630 BBC: Jazz for the Asking. A jazz music request show.
0630 Radio Australia: Conversations. Talks with well-known Australians.
0706 Christian Science Monitor: Herald of Christian Science. See S 0006.
0709 BBC: Twenty-Four Hours. See S 0509.
0713 Radio Australia: You Asked for It. Listener questions about Australia.
0730 BBC: From Our Own Correspondent. See S 0315.
0730 Radio Australia: Communicator. See S 0230.
0745 BBC: Book Choice. Short reviews of current or future best-sellers.
0750 BBC: Waveguide. How to hear the BBC better.
1106 Christian Science Monitor: Herald of Christian Science. See S 0006.
1113 Radio Australia: Music of Radio Australia. See S 0313.
1115 BBC: From Our Own Correspondent. See S 0315.
1130 BBC: Musical Feature. See S 0030.
1130 Radio Australia: International Top Hits. John Anderson with the week's big sounds.
1201 BBC: Play of the Week. See S 0101.
1206 Christian Science Monitor: Herald of Christian Science. See S 0006.
1225 Radio Australia: Propagation Report. See S 0425.
1230 Radio Australia: Communicator. See S 0230.
1306 Christian Science Monitor: Herald of Christian Science. See S 0006.
1309 BBC: Twenty-Four Hours. See S 0509.
1313 Radio Australia: Smith's Weekly. Keith Smith's potpourri of news and views.
1330 BBC: Sports Roundup. The day's sports news.
1330 Radio Australia: Sports Results. Reports from Australian and international sporting events.
1345 BBC: Personal View. See S 0445.
1345 Radio Australia: Music of Radio Australia. See S 0313.
1401 BBC: Feature. Programming on various subjects.
1406 Christian Science Monitor: Herald of Christian Science. See S 0006.
1430 BBC: Anything Goes. Sounds from the BBC archives as requested by listeners.
1430 Radio Australia: Innovations. Australian inventions, innovative practices and processes.
1506 Christian Science Monitor: Herald of Christian Science. See S 0006.
1513 Radio Australia: Music of Radio Australia. See S 0313.
1515 BBC: From the Proms. Highlights from the Promenade classical music concerts (except September 17th, 24th: Concert Hall, a program of classical music from the world's great concert halls).
1530 Radio Australia: Matters of Faith. Doctrines and beliefs of the Pacific basin.

MT Program Team

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Jim Frimmel
Willow Park, Texas

Dale Vanderpoel
Ft. Lauderdale, Florida

LEGEND

* The first four digits of an entry are the program start time in UTC.
* The time is followed by the station name, program name, and a brief summary of the program's content.
* Some listings may be followed by "See X 0000." The letter stands for a day of the week:

S=Sunday M=Monday
T=Tuesday W=Wednesday
H=Thursday F=Friday
A=Saturday

The four digits stand for a time in UTC. Listeners should check back to that date and time to find out more about that particular program.

* All broadcasts are listed in chronological order, starting on Sunday at 0000 UTC and ending on Saturday at 2359 UTC.
* All days are in UTC. Remember that if you are listening in North American prime time, it is actually the next morning UTC. For example, if you are listening to a program at 8:01 pm [EDT] on your Thursday night, that's equal to 0001 UTC and therefore Friday morning UTC.

We suggest that you tune in to a program a few minutes before the schedule start time, as some stations have tentative schedules which may slightly vary. We invite listeners and stations to send program information to the program manager at the address above.

program guide

1606 Christian Science Monitor: Herald of Christian Science. See S 0006.
1615 BBC: A Year of Dying Dangerously. A look at murder and manslaughter in today's society.
1627 Radio Australia: Propagation Report. See S 0425.
1630 Radio Australia: Music of Radio Australia. See S 0313.
1645 BBC: Letter from America. See S 0545.
1645 Radio Australia: Sports Results. See S 1330.
2306 Christian Science Monitor: Herald of Christian Science. See S 0006.
2309 BBC: Book Choice. See S 0745.
2313 Radio Australia: Music of Radio Australia. See S 0313.
2315 BBC: Letter from America. See S 0545.
2330 BBC: Feature. See S 1401.
2330 Radio Australia: Monitor. News about scientific, medical, and technological developments.

Monday

September 4, 11, 18, 25

0006 Christian Science Monitor: Herald of Christian Science. See S 0006.
0030 BBC: In Praise of God. A half-hour program of worship.
0030 Radio Australia: Music of Radio Australia. See S 0313.
0101 BBC: Feature. Programming on various subjects.
0106 Christian Science Monitor: Herald of Christian Science. See S 0006.
0113 Radio Australia: Window on Australia. A look at people and places all over the nation.
0130 Radio Australia: This Australia. Documentaries about the land "down under".
0145 BBC: Learning to Play. George Macpherson finds practical tips for learning to play a musical instrument.
0206 Christian Science Monitor (Canada/Central America): Herald of Christian Science. See S 0006.
0206 Christian Science Monitor (East Africa): News Focus. In-depth news analyses focusing on major stories in the news.
0209 BBC: British Press Review. See S 0209.
0215 BBC: Andy Kershaw's World of Music. Exotic and innovative music from the world over.
0230 BBC: Science in Action. The latest in scientific developments.
0230 Radio Australia: International Country Music. The latest country chart makers and top albums.
0234 Christian Science Monitor (East Africa): Kaleidoscope. News features and special segments on a variety of topics.
0306 Christian Science Monitor (Canada/Central America): Herald of Christian Science. See S 0006.
0306 Christian Science Monitor (East Africa): One Norway Street. Current affairs reports from correspondents worldwide.
0313 Radio Australia: Music of Radio Australia. See S 0313.
0315 BBC: Good Books. A recommendation of a book to read.
0330 BBC: Anything Goes. See S 1430.
0330 Radio Australia: Sports Results. See S 1330.
0334 Christian Science Monitor (East Africa): Letterbox. Staff members respond to listener letters.
0345 Radio Australia: Music of Radio Australia. See S 0313.
0406 Christian Science Monitor (Canada/Central America): Herald of Christian Science. See S 0006.
0406 Christian Science Monitor (East Africa): News Focus. See M 0206.
0425 Radio Australia: Propagation Report. See S 0425.
0430 BBC: Off the Shelf. A reading selected from the best of world literature.
0430 Radio Australia: AgriNews. News and information about agricultural and primary industries.
0434 Christian Science Monitor (East Africa): Kaleidoscope. See M 0234.
0445 BBC: Nature Now. Information about flora, fauna, and natural resources.
0445 Radio Australia: Music of Radio Australia. See S 0313.
0506 Christian Science Monitor (Canada/Central America): Herald of Christian Science. See S 0006.
0506 Christian Science Monitor (East Africa): One Norway Street. See M 0306.
0509 BBC: Twenty-Four Hours. See S 0509.
0513 Radio Australia: Pacific Rap. Reports and discussion on regional issues by correspondents.
0530 BBC: Waveguide. See S 0750.
0530 Radio Australia: Sports Results. See S 1330.
0533 Radio Australia: Window on Australia. See M 0113.
0534 Christian Science Monitor (East Africa): Letterbox. See M 0334.
0540 BBC: Words of Faith. See S 0540.
0545 BBC: Recording of the Week. A personal choice from the latest classical music releases.
0545 Radio Australia: Music of Radio Australia. See S 0313.
0606 Christian Science Monitor: News Focus. See M 0206.
0630 BBC: Feature. See S 1401.
0630 Radio Australia: Australian Country Style. Local country music from Australia.

Oteibea Quist-Arcton presents "Network Africa" on the BBC's Africa Service. The program can be heard on weekdays at 0335, 0435, 0635 and 0735 UTC.

0634 Christian Science Monitor: Kaleidoscope. See M 0234.
0706 Christian Science Monitor: One Norway Street. See M 0306.
0709 BBC: Twenty-Four Hours. See S 0509.
0713 Radio Australia: Pacific Sunrise. Business and export developments in the Pacific.
0730 BBC: A Year of Dying Dangerously. See S 1615.
0730 Radio Australia: Sports Results. See S 1330.
0733 Radio Australia: Pacific Women. Patti Orofino

NEWS GUIDE

This is your guide to news broadcasts on the air. All broadcasts are daily unless otherwise noted by brackets. These brackets enclose day codes denoting days of broadcast. The codes are as follows:

S= Sunday
M= Monday
T= Tuesday
W=Wednesday
H= Thursday
F= Friday
A= Saturday

We invite listeners and stations to send program information to the program manager.

0000 BBC: Newsdesk
0000 Christian Science Monitor: News
0000 Kol Israel: News
0000 KVOH: UPI Radio News
0000 Radio Australia: International Report
0000 Radio Beijing: News
0000 Radio Canada Int'l: News [S-M]
0000 Radio Havana Cuba: Int'l News [M-A]
0000 Radio Moscow: News
0000 Spanish National Radio: News
0000 Voice of America: News
0010 Radio Beijing: News About China
0030 Christian Science Monitor: News [T-F]
0030 KVOH: UPI Headline News
0030 Radio Havana Cuba: Newsbreak [M-A]
0030 Radio Moscow (World Service): News in Brief
0030 Radio Netherlands: News [T-S]
0030 Voice of America (Americas, East Asia): News (Special English) [T-S]
0030 Voice of America (East Asia): News (Special English) [M]
0051 Spanish National Radio: News Summary [S]
0100 BBC: News Summary
0100 Belize Radio One: Network News
0100 Christian Science Monitor: News
0100 Deutsche Welle: World News
0100 Kol Israel: News
0100 KVOH: UPI Radio News [T-A]
0100 Radio Australia: World and Australian News
0100 Radio Berlin Int'l: News
0100 Radio Canada Int'l: News [S-M]
0100 Radio Havana Cuba: Int'l News [M-A]
0100 Radio Japan: News [M-A]
0100 Radio Moscow: News
0100 Radio Prague: News
0100 Radiotelevisione Italiana: News
0100 Spanish National Radio: News
0100 Voice of America: News
0100 Voice of Indonesia: News
0115 Radio Havana Cuba: Cuban National News [M-A]
0130 Christian Science Monitor: News [T-F]
0130 KVOH: UPI Headline News [T-A]
0130 Radio Havana Cuba: News [M-A]
0130 RadioMoscow(Wld Serv):News in Brief[S-M]

program guide

examines women's issues.
0734 Christian Science Monitor: Letterbox. See M 0334.
1106 Christian Science Monitor: One Norway Street. See M 0306.
1113 Radio Australia: Window on Australia. See M 0113.
1115 BBC: Health Matters. A look at new developments in the world of fitness and medicine.
1130 BBC: The Ken Bruce Show. See S 0230.
1130 Radio Australia: Music of Radio Australia. See S 0313.
1134 Christian Science Monitor: Letterbox. See M 0334.
1206 Christian Science Monitor: News Focus. See M 0206.
1215 BBC: Quiz. Details unavailable at press time (except September 4th, 11th: Brain of Britain Playoffs, competition to find the best Brain of Britain player of the decade).
1225 Radio Australia: Propagation Report. See S 0425.
1230 Radio Australia: Conversations. See S 0630.
1234 Christian Science Monitor: Kaleidoscope. See M 0234.
1245 BBC: Sports Roundup. See S 1330.
1306 Christian Science Monitor: One Norway Street. See M 0306.
1309 BBC: Twenty-Four Hours. See S 0509.
1313 Radio Australia: Music of Radio Australia. See S 0313.
1330 BBC: A Year of Dying Dangerously. See S 1615.
1330 Radio Australia: Sports Results. See S 1330.
1334 Christian Science Monitor: Letterbox. See M 0334.
1345 Radio Australia: Music of Radio Australia. See S 0313.
1405 BBC: Outlook. An excellent magazine (i.e., covering everything!) program.
1406 Christian Science Monitor: News Focus. See M 0206.
1425 Radio Australia: Stock Exchange Report. Financial news from the Pacific.
1430 BBC: Off the Shelf. See M 0430.
1430 Radio Australia: Window on Australia. See M 0113.
1430 Christian Science Monitor: Kaleidoscope. See M 0234.
1445 BBC: Global Concerns. See S 0215.
1445 Radio Australia: Music of Radio Australia. See S 0313.
1506 Christian Science Monitor: One Norway Street. See M 0306.
1513 Radio Australia: Pacific Sunrise. See M 0713.
1515 BBC: Feature. See M 0101.
1530 Radio Australia: Monitor. See S 2330.
1534 Christian Science Monitor: Letterbox. See M 0334.
1606 Christian Science Monitor: News Focus. See M 0206.
1615 BBC: Good Books. See M 0315.
1625 Radio Australia: Stock Exchange Report. See M 1425.
1627 Radio Australia: Propagation Report. See S 0425.
1630 BBC: Health Matters. See M 1115.
1630 Radio Australia: Music of Radio Australia. See S 0313.
1634 Christian Science Monitor: Kaleidoscope. See M 0234.
1645 BBC: The World Today. News analysis on a selected location or event in the news.
1645 Radio Australia: Sports Results. See S 1330.
2306 Christian Science Monitor: One Norway Street. See M 0306.
2309 BBC: Commentary. Background to the news from a wide range of specialists.
2313 Radio Australia: Music of Radio Australia. See S 0313.
2315 BBC: Behind the Facade. A personal look at the composer William Walton, as written by his wife.
2330 BBC: Multitrack 1: Top 20. What's hot on the British pop music charts.
2330 Radio Australia: Arts Roundabout. See S 0430.
2334 Christian Science Monitor: Letterbox. See M 0334.

Tuesday

September 5, 12, 19, 26

0006 Christian Science Monitor: News Focus. See M 0206.
0030 BBC: Megamix. A compendium of music, sport, fashion, health, travel, news and views for young people.
0030 Radio Australia: Music of Radio Australia. See S 0313.
0034 Christian Science Monitor: Kaleidoscope. See M 0234.
0101 BBC: Outlook. See M 1405.
0106 Christian Science Monitor: One Norway Street. See M 0306.
0113 Radio Australia: Window on Australia. See M 0113.
0125 BBC: Financial News. News of commodity prices and significant moves in currency and stock markets.

Robert Robinson wittily hosts the excellent BBC quiz show "Brain of Britain," which airs on Mondays at 1215 UTC, repeated on Thursdays at 0330 UTC.

0130 BBC: Short Story. Brief tales written by BBC listeners.
0130 Radio Australia: Conversations. See S 0630.
0134 Christian Science Monitor: Letterbox. See M 0334.
0145 BBC: Europe's World. A magazine program reflecting life in Europe and its links with other parts of the world.
0206 Christian Science Monitor: News Focus. See M 0206.
0209 BBC: British Press Review. See S 0209.
0215 BBC: Network UK. A look at the issues and events that affect the lives of people throughout the UK.
0230 BBC: Sports International. Feature program on a topic or person making sports headlines.
0230 Radio Australia: Taim Bilong Masta. Australia's involvement with Papua New Guinea over the last 100 years.
0234 Christian Science Monitor: Kaleidoscope. See M 0234.

news guide cont'd from p.57

0145 Radio Berlin Int'l: News
0150 HCJB: News [T-A]
0151 Radio Veritas Asia: World News [M-F]
0151 Spanish National Radio: News Summary [S]
0153 Radio Prague: News Wrap-Up
0155 HCJB: News [S]
0155 Radio Veritas Asia: World News [A]
0155 Voice of Indonesia: News in Brief
0200 BBC: World News
0200 Christian Science Monitor: News
0200 Deutsche Welle: World News
0200 HCJB: News [M]
0200 KVOH: UPI Radio News [T-A]
0200 Radio Australia: International Report
0200 Radio Canada Int'l: As It Happens [T-A]
0200 Radio Havana Cuba: Int'l News [M-A]
0200 Radio Kiev: News
0200 Radio Moscow: News
0200 Radio RSA: News
0200 Swiss Radio Int'l: News
0200 Voice of America: News
0200 Voice of Free China: News and Commentary
0215 Radio Cairo: News
0230 Christian Science Monitor (East Africa): News [M]
0230 Christian Science Monitor: News [T-F]
0230 KVOH: UPI Headline News [T-A]
0230 Radio Berlin Int'l: News
0230 Radio Finland: Northern Report [T-A]
0230 Radio Havana Cuba: Newsbreak [M-A]
0230 Radio Moscow (World Service): News in Brief [S]
0230 Radio Portugal: News [T-A]
0300 BBC: World News
0300 Belize Radio One: News
0300 Christian Science Monitor: News
0300 Deutsche Welle: World News
0300 HCJB: News [T-A]
0300 KVOH: UPI Radio News [T-A]
0300 Radio Australia: World and Australian News
0300 Radio Beijing: News
0300 Radio Berlin Int'l: News
0300 Radio Canada Int'l: News [M-F]
0300 Radio for Peace Int'l: News [T,A]
0300 Radio Havana Cuba: Int'l News [M-A]
0300 Radio Japan: News [M-A]
0300 Radio Moscow: News
0300 Radio Prague: News
0300 Voice of America: News
0300 Voice of Free China: News and Commentary
0309 BBC: News About Britain
0310 Radio Beijing: News About China
0315 Radio Cairo: News
0315 Radio Havana Cuba: Cuban National News [M-A]
0330 Christian Science Monitor (East Africa): News [M]
0330 Christian Science Monitor: News [T-F]
0330 KVOH: UPI Headline News [T-A]
0330 Radio Havana Cuba: News [M-A]
0330 Radio Moscow (World Service): News in Brief [S-M]
0330 Radio Netherlands: News [T-S]
0345 Radio Berlin Int'l: News

BULLETIN BOARD

"Brain of Britain"

The popular BBC World Service quiz show "Brain of Britain" enters a rare series of playoffs this month. The 1989 series final will be broadcast on August 28th at 1215 UTC, repeated on August 31st at 0330 UTC. The 1989 Brain of Britain will face the champs from 1987 and 1988 in "Brain of Brains," to be heard on September 4th at 1215 UTC and again on September 7th at 0330 UTC.

And as if that's not enough, the winner from that broadcast will face the winners of two previous "Brains of Brains" to decide who is the "Top Brain". The "Top Brain" program airs only once every nine years and features the cream of contestants going back as far as 1981! (It would be wise to catch this program as it won't be heard again until September 1998!)

"Top Brain" airs on Sept 11th at 1215 UTC and again on Sept 14th at 0330 UTC.

program guide

0306 Christian Science Monitor: One Norway Street. See M 0306.
0313 Radio Australia: Music of Radio Australia. See S 0313.
0315 BBC: The World Today. See M 1645.
0330 BBC: John Peel. Tracks from newly released albums and singles from the contemporary music scene.
0330 Radio Australia: Sports Results. See S 1330.
0334 Christian Science Monitor: Letterbox. See M 0334.
0345 Radio Australia: Music of Radio Australia. See S 0313.
0406 Christian Science Monitor: News Focus. See M 0206.
0425 Radio Australia: Propagation Report. See S 0425.
0430 BBC: Off the Shelf. See M 0430.
0430 Radio Australia: Business Horizons. Business and trade in Australia and neighboring regions.
0434 Christian Science Monitor: Kaleidoscope. See M 0234.
0445 BBC: New Ideas. A radio shop window for new products and inventions.
0445 Radio Australia: Music of Radio Australia. See S 0313.
0455 BBC: Book Choice. See S 0745.
0506 Christian Science Monitor: One Norway Street. See M 0306.
0509 BBC: Twenty-Four Hours. See S 0509.
0513 Radio Australia: Pacific Rap. See M 0513.
0530 BBC: Financial News. See T 0125.
0533 Radio Australia: Window on Australia. See M 0113.
0534 Christian Science Monitor: Letterbox. See M 0334.
0540 BBC: Words of Faith. See S 0540.
0545 BBC: The World Today. See M 1645.
0545 Radio Australia: Music of Radio Australia. See S 0313.
0606 Christian Science Monitor: News Focus. See M 0206.
0630 BBC: Counterpoint. The best in blues, jazz, and pop music, and talks with the performers who create it.
0630 Radio Australia: Monitor. See S 2330.
0634 Christian Science Monitor: Kaleidoscope. See M 0234.
0706 Christian Science Monitor: One Norway Street. See M 0306.
0709 BBC: Twenty-Four Hours. See S 0509.
0713 Radio Australia: Music of Radio Australia. See S 0313.
0730 BBC: Europe's World. See T 0145.
0730 Radio Australia: Sports Results. See S 1330.
0733 Radio Australia: Pacific Requests. Dick Paterson plays listener requests.
0734 Christian Science Monitor: Letterbox. See M 0334.
0745 BBC: Network UK. See T 0215.
0745 Radio Australia: Pacific Voices. A look at opinion in the Pacific region.
1106 Christian Science Monitor: One Norway Street. See M 0306.
1113 Radio Australia: Window on Australia. See M 0113.
1115 BBC: Waveguide. See S 0750.
1125 BBC: Book Choice. See S 0745.
1130 BBC: Megamix. See T 0030.
1130 Radio Australia: Soundabout. Contemporary music for young people, with interviews and features.
1134 Christian Science Monitor: Letterbox. See M 0334.
1206 Christian Science Monitor: News Focus. See M 0206.
1215 BBC: Multitrack 1: Top 20. See M 2330.
1225 Radio Australia: Propagation Report. See S 0425.
1230 Radio Australia: Music of Radio Australia. See S 0313.
1234 Christian Science Monitor: Kaleidoscope. See M 0234.
1245 BBC: Sports Roundup. See S 1330.
1306 Christian Science Monitor: One Norway Street. See M 0306.
1309 BBC: Twenty-Four Hours. See S 0509.
1313 Radio Australia: Music of Radio Australia. See S 0313.
1330 BBC: Network UK. See T 0215.
1330 Radio Australia: Sports Results. See S 1330.
1334 Christian Science Monitor: Letterbox. See M 0334.
1345 BBC: Stuart Colman's Record Hop (except September 19th, 26th: Boys in the Back Room). See S 0430.
1345 Radio Australia: Music of Radio Australia. See S 0313.
1405 BBC: Outlook. See M 1405.
1406 Christian Science Monitor: News Focus. See M 0206.
1425 Radio Australia: Stock Exchange Report. See M 1425.
1430 BBC: Off the Shelf. See M 0430.
1430 Radio Australia: Window on Australia. See M 0113.
1434 Christian Science Monitor: Kaleidoscope. See M 0234.
1445 BBC: Learning to Play. See M 0145.
1445 Radio Australia: Music of Radio Australia. See S 0313.
1506 Christian Science Monitor: One Norway Street. See M 0306.
1513 Radio Australia: Music of Radio Australia. See S 0313.
1515 BBC: A Jolly Good Show. Dave Lee Travis presents your record requests and dedications in his own unique way, including the Album of the Month.
1530 Radio Australia: Try to Remember. A musical portrait of the last 50 years.
1534 Christian Science Monitor: Letterbox. See M 0334.
1606 Christian Science Monitor: News Focus. See M 0206.
1615 BBC: Omnibus. A half-hour program on practically any topic.
1625 Radio Australia: Stock Exchange Report. See M 1425.
1627 Radio Australia: Propagation Report. See S 0425.
1630 Radio Australia: Music of Radio Australia. See S 0313.
1634 Christian Science Monitor: Kaleidoscope. See M 0234.
1645 BBC: The World Today. See M 1645.
1645 Radio Australia: Sports Results. See S 1330.
2306 Christian Science Monitor: One Norway Street. See M 0306.
2309 BBC: Commentary. See M 2309.
2313 Radio Australia: Music of Radio Australia. See S 0313.
2315 BBC: From the Proms (except September 19th, 26th: Concert Hall). See S 1515.
2330 Radio Australia: Smith's Weekly. See S 1313.
2334 Christian Science Monitor: Letterbox. See M 0334.

0350 Radiotelevisione Italiana: News
0353 Radio Prague: News Wrap-up
0400 BBC: Newsdesk
0400 Christian Science Monitor: News
0400 Deutsche Welle: World News
0400 HCJB: News [M-A]
0400 Kol Israel: News
0400 Radio Australia: International Report
0400 Radio Beijing: News
0400 Radio Canada Int'l: News [M-F]
0400 Radio Havana Cuba: Int'l News [M-A]
0400 Radio Moscow: News
0400 Radio RSA: News
0400 Swiss Radio Int'l: News
0400 Voice of America: News
0410 Radio Beijing: News About China
0425 Radiotelevisione Italiana: News
0430 Christian Science Monitor (East Africa): News [M]
0430 Christian Science Monitor: News [T-F]
0430 Radio Havana Cuba: Newsbreak [M-A]
0430 Radio Moscow (World Service): News in Brief
0430 Radio Netherlands: News [M-A]
0500 BBC: World News
0500 Christian Science Monitor: News
0500 Deutsche Welle: World News
0500 HCJB: News [S-M]; Latin American News [T-A]
0500 Radio Australia: World and Australian News
0500 Radio Berlin Int'l: News
0500 Radio Havana Cuba: Int'l News [M-A]
0500 Radio Japan: News [S-F]
0500 Radio Moscow: News
0500 Radio New Zealand Int'l: News
0500 Spanish National Radio: News
0500 Voice of America: News
0515 Radio Berlin Int'l: News
0515 Radio Canada Int'l: News [M-F]
0515 Radio Havana Cuba: Cuban National News [M-A]
0530 Christian Science Monitor (East Africa): News [M]
0530 Christian Science Monitor: News [T-F]
0530 Radio Havana Cuba: News [M-A]
0530 Radio Moscow (World Service): News in Brief [S]
0545 Radio Canada Int'l: News [M-F]
0550 HCJB: News [T-A]
0551 Spanish National Radio: News Summary [S]
0555 HCJB: News [S]
0600 BBC: Newsdesk
0600 Christian Science Monitor: News
0600 Deutsche Welle: World News
0600 HCJB: News [M]
0600 Radio Australia: International Report
0600 Radio Havana Cuba: Int'l News [M-A]
0600 Radio Korea: News
0600 Radio Moscow: News
0600 Voice of America: News
0630 Christian Science Monitor: News [M-F]
0630 Radio Finland: Northern Report [T-A]
0630 Radio Havana Cuba: Newsbreak [M-A]
0630 Radio Moscow (World Service): News in Brief [S-M]
0630 Swiss Radio Int'l: News
0655 HCJB: News [M-A]
0700 BBC: World News
0700 BRT, Brussels: News [M-F]

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2345 Radio Australia: Music of Radio Australia. See S 0313.

Wednesday

September 6, 13, 20, 27

0006 Christian Science Monitor: News Focus. See M 0206.
0030 BBC: Omnibus. See T 1615.
0030 Radio Australia: Music of Radio Australia. See S 0313.
0034 Christian Science Monitor: Kaleidoscope. See M 0234.
0101 BBC: Outlook. See M 1405.
0106 Christian Science Monitor: One Norway Street. See M 0306.
0113 Radio Australia: Window on Australia. See M 0113.
0125 BBC: Financial News. See T 0125.
0130 BBC: Dr. Johnson's Poets. A look at some of the world's great poets, as noted by the writer Samuel Johnson.
0130 Radio Australia: Try to Remember. See T 1530.
0134 Christian Science Monitor: Letterbox. See M 0334.
0145 BBC: Country Style. David Allan presents British country music.
0206 Christian Science Monitor: News Focus. See M 0206.
0209 BBC: British Press Review. See S 0209.
0215 BBC: Health Matters. See M 1115.
0230 BBC: McCartney on McCartney. An audio biography of Paul McCartney, featuring interviews with the ex-Beatle himself.
0230 Radio Australia: Anything Goes. See S 0030.
0234 Christian Science Monitor: Kaleidoscope. See M 0234.
0306 Christian Science Monitor: One Norway Street. See M 0306.
0313 Radio Australia: Music of Radio Australia. See S 0313.
0315 BBC: The World Today. See M 1645.
0330 BBC: Discovery. An in-depth look at scientific research.
0330 Radio Australia: Sports Results. See S 1330.
0334 Christian Science Monitor: Letterbox. See M 0334.
0345 Radio Australia: Music of Radio Australia. See S 0313.
0406 Christian Science Monitor: News Focus. See M 0206.
0425 Radio Australia: Propagation Report. See S 0425.
0430 BBC: Off the Shelf. See M 0430.
0430 Radio Australia: Smith's Weekly. See S 1313.
0434 Christian Science Monitor: Kaleidoscope. See M 0234.
0445 BBC: Country Style. See W 0145.
0506 Christian Science Monitor: One Norway Street. See M 0306.
0509 BBC: Twenty-Four Hours. See S 0509.
0513 Radio Australia: Pacific Rap. See M 0513.
0530 BBC: Financial News. See T 0125.
0530 Radio Australia: Sports Results. See S 1330.
0533 Radio Australia: Window on Australia. See M 0113.
0534 Christian Science Monitor: Letterbox. See M 0334.
0540 BBC: Words of Faith. See S 0540.
0545 BBC: The World Today. See M 1645.
0545 Radio Australia: Pacific Spotlight. Lifestyles of the Pacific region.

Anne Lie Nymoen, a reporter for Radio Norway International, tests out her recording equipment.

0606 Christian Science Monitor: News Focus. See M 0206.
0630 BBC: Meridian. The world of the arts, including music, drama, and books.
0630 Radio Australia: Music of Radio Australia. See S 0313.
0634 Christian Science Monitor: Kaleidoscope. See M 0234.
0706 Christian Science Monitor: One Norway Street. See M 0306.
0709 BBC: Twenty-Four Hours. See S 0509.
0713 Radio Australia: Music of Radio Australia. See S 0313.
0730 BBC: Development '89. Aid and development issues.
0730 Radio Australia: Sports Results. See S 1330.
0733 Radio Australia: Music of Radio Australia. See S 0313.
0734 Christian Science Monitor: Letterbox. See M 0334.
1106 Christian Science Monitor: One Norway Street. See M 0306.
1113 Radio Australia: Window on Australia. See M 0113.
1115 BBC: Country Style. See W 0145.
1130 BBC: Meridian. See W 0630.
1130 Radio Australia: Music of Radio Australia. See S 0313.
1134 Christian Science Monitor: Letterbox. See M 0334.
1206 Christian Science Monitor: News Focus. See M 0206.
1215 BBC: In a Nutshell. A look at the "isms" of our time, from humanism to communism.
1225 BBC: The Farming World. Issues in agriculture.
1225 Radio Australia: Propagation Report. See S 0425.
1230 Radio Australia: Interaction. An exploration of the activities and experiences of multicultural Australia.
1234 Christian Science Monitor: Kaleidoscope. See M 0234.
1245 BBC: Sports Roundup. See S 1330.
1306 Christian Science Monitor: One Norway Street. See M 0306.
1309 BBC: Twenty-Four Hours. See S 0509.
1313 Radio Australia: Music of Radio Australia. See S 0313.
1330 BBC: Development '89. See W 0730.
1330 Radio Australia: Sports Results. See S 1330.
1334 Christian Science Monitor: Letterbox. See M 0334.
1345 Radio Australia: Music of Radio Australia. See S 0313.
1405 BBC: Outlook. See M 1405.
1406 Christian Science Monitor: News Focus. See M 0206.
1425 Radio Australia: Stock Exchange Report. See M 1425.
1430 BBC: Off the Shelf. See M 0430.

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0700 Christian Science Monitor: News
0700 Radio Australia: World and Australian News
0700 Radio Havana Cuba: Int'l News [M-A]
0700 Radio Japan: News [S-F]
0700 Radio Moscow (World Service): News
0700 Voice of Free China: News and Commentary
0715 Radio Havana Cuba: Cuban National News [M-A]
0730 Christian Science Monitor: News [M-F]
0730 Radio Havana Cuba: News [M-A]
0730 Radio Moscow (World Service): News in Brief
0730 Radio Netherlands: News [M-A]
0745 Radio Berlin Int'l: News
0800 BBC: World News
0800 Christian Science Monitor: News
0800 Radio Australia: International Report
0800 Radio Finland: Northern Report [T-S]
0800 Radio Korea: News
0800 Radio Moscow (World Service): News
0800 Voice of Indonesia: News
0830 Christian Science Monitor: News [M-F]
0830 Radio Finland: Northern Report [T-S]
0830 Radio Moscow (World Service): News in Brief [S-M]
0830 Radio Netherlands: News [M-A]
0830 Swiss Radio Int'l: News
0855 Voice of Indonesia: News in Brief
0900 BBC: World News
0900 BRT, Brussels: News [M-F]
0900 Christian Science Monitor: News
0900 Deutsche Welle: World News
0900 Radio Australia: World and Australian News
0900 Radio Berlin Int'l: News
0900 Radio Japan: News [S-F]
0900 Radio Moscow (World Service): News
0930 Christian Science Monitor: News [M-F]
0930 Radio Canada Int'l: News [M-F]
0930 Radio Moscow (World Service): News in Brief [S]
0945 Radio Berlin Int'l: News
1000 BBC: News Summary
1000 Christian Science Monitor: News
1000 Kol Israel: News
1000 Radio Australia: International Report
1000 Radio Moscow (World Service): News
1000 Radio New Zealand Int'l: News [M-F]
1000 Swiss Radio Int'l: News
1000 Voice of America: News
1030 Radio Moscow (World Service): News in Brief [S-M]
1030 Radio Netherlands: News [M-A]
1100 BBC: World News
1100 Christian Science Monitor: News [M-F]
1100 Deutsche Welle: World News
1100 Radio Australia: World and Australian News
1100 Radio Beijing: News
1100 Radio Berlin Int'l: News
1100 Radio Finland: Northern Report [T-F]
1100 Radio Japan: News [S-F]
1100 Radio Korea: News
1100 Radio Moscow (World Service): News
1100 Radio New Zealand Int'l: News
1100 Radio RSA: News
1100 Swiss Radio Int'l: News

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1430 Radio Australia: Window on Australia. See M 0113.
1434 Christian Science Monitor: Kaleidoscope. See M 0234.
1445 BBC: Business Matters. See W 0430.
1445 Radio Australia: Music of Radio Australia. See S 0313.
1506 Christian Science Monitor: One Norway Street. See M 0306.
1513 Radio Australia: Music of Radio Australia. See S 0313.
1515 BBC: Behind the Facade. See M 2315.
1530 BBC: Funny That Way. Profiles of great comedians (except September 27th: Two Cheers for September, a satirical look back at the month just past).
1530 Radio Australia: Along the Mighty Murray. People, places, and events encountered along Australia's greatest river.
1534 Christian Science Monitor: Letterbox. See M 0334.
1606 Christian Science Monitor: News Focus. See M 0206.
1615 BBC: Counterpoint. See T 0630.
1625 Radio Australia: Stock Exchange Report. See M 1425.
1627 Radio Australia: Propagation Report. See S 0425.
1630 Radio Australia: Music of Radio Australia. See S 0313.
1634 Christian Science Monitor: Kaleidoscope. See M 0234.
1645 BBC: The World Today. See M 1645.
1645 Radio Australia: Sports Results. See S 1330.
2306 Christian Science Monitor: One Norway Street. See M 0306.
2309 BBC: Commentary. See M 2309.
2313 Radio Australia: Music of Radio Australia. See S 0313.
2315 BBC: Good Books. See M 0315.
2330 BBC: Multitrack 2. Mitchell Johnson presents pop music and news.
2330 Radio Australia: You Asked for It. See S 0713.
2334 Christian Science Monitor: Letterbox. See M 0334.
2345 Radio Australia: Music of Radio Australia. See S 0313.

Thursday

September 7, 14, 21, 28

0006 Christian Science Monitor: News Focus. See M 0206.
0030 BBC: Funny That Way (except September 28th: Two Cheers for September). See W 1530.
0030 Radio Australia: Music of Radio Australia. See S 0313.
0034 Christian Science Monitor: Kaleidoscope. See M 0234.
0101 BBC: Outlook. See M 1405.
0106 Christian Science Monitor: One Norway Street. See M 0306.
0113 Radio Australia: Window on Australia. See M 0113.
0125 BBC: Financial News. See T 0125.
0130 BBC: Waveguide. See S 0750.
0130 Radio Australia: Interaction. See W 1230.
0134 Christian Science Monitor: Letterbox. See M 0334.
0140 BBC: Book Choice. See S 0745.
0145 BBC: Society Today. A weekly look at the changes in Britain.
0206 Christian Science Monitor: News Focus. See M 0206.
0209 BBC: British Press Review. See S 0209.
0215 BBC: Network UK. See T 0215.
0230 BBC: Taking Issue. A four-way discussion program.
0230 Radio Australia: Word of Mouth. Oral histories of Australians.
0234 Christian Science Monitor: Kaleidoscope. See M 0234.
0306 Christian Science Monitor: One Norway Street. See M 0306.
0313 Radio Australia: Music of Radio Australia. See S 0313.
0315 BBC: The World Today. See M 1645.
0330 BBC: Quiz (except September 7th, 14th: Brain of Britain Playoffs). See M 1215.
0330 Radio Australia: Sports Results. See S 1330.
0334 Christian Science Monitor: Letterbox. See M 0334.
0345 Radio Australia: Music of Radio Australia. See S 0313.
0406 Christian Science Monitor: News Focus. See M 0206.
0425 Radio Australia: Propagation Report. See S 0425.
0430 BBC: Off the Shelf. See M 0430.
0430 Radio Australia: Innovations. See S 1430.
0434 Christian Science Monitor: Kaleidoscope. See M 0234.
0445 BBC: Andy Kershaw's World of Music. See M 0215.
0506 Christian Science Monitor: One Norway Street. See M 0306.
0509 BBC: Twenty-Four Hours. See S 0509.
0513 Radio Australia: Pacific Rap. See M 0513.
0530 BBC: Financial News. See T 0125.

Fanus Venter heads Radio RSA amid what the station calls "an increasingly hostile environment"; namely, Western opposition to the apartheid system.

0530 Radio Australia: Sports Results. See S 1330.
0533 Radio Australia: Window on Australia. See M 0113.
0534 Christian Science Monitor: Letterbox. See M 0334.
0540 BBC: Words of Faith. See S 0540.
0545 BBC: The World Today. See M 1645.
0545 Radio Australia: Pacific Women. See M 0733.
0606 Christian Science Monitor: News Focus. See M 0206.
0630 BBC: In a Nutshell. See W 1215.
0630 Radio Australia: Interaction. See W 1230.
0634 Christian Science Monitor: Kaleidoscope. See M 0234.
0640 BBC: The Farming World. See W 1225.
0706 Christian Science Monitor: One Norway Street. See M 0306.
0709 BBC: Twenty-Four Hours. See S 0509.
0713 Radio Australia: Music of Radio Australia. See S 0313.
0730 BBC: Write On... Paddy Feeny answers listener letters.
0730 Radio Australia: Sports Results. See S 1330.
0733 Radio Australia: Taim Bilong Masta. See T 0230.

1100 Voice of America: News
1109 BBC: News About Britain
1110 Belize Radio One: News Summary [T-F]
1110 Radio Beijing: News About China
1115 Trans World Radio, Bonaire: News [M-F]
1120 Belize Radio One: News Summary [A]
1125 Belize Radio One: News Summary [M]
1130 Christian Science Monitor: News
1130 Radio Berlin Int'l: News
1130 Radio Moscow (World Service): News in Brief
1130 Radio Netherlands: News [M-A]
1152 Radio RSA: News in Brief
1200 BBC: News Summary [S]; Newsreel [M-A]
1200 Christian Science Monitor: News [M-F]
1200 Radio Australia: International Report
1200 Radio Beijing: News
1200 Radio Canada Int'l: World Report [M-F]
1200 Radio Finland: Northern Report [T-F]
1200 Radio Moscow (World Service): News
1200 Swiss Radio Int'l: News
1200 Voice of America: News
1210 Radio Beijing: News About China
1215 Radio Berlin Int'l: News
1230 BRT, Brussels: News [M-S]
1230 Christian Science Monitor: News
1230 Radio Moscow (World Service): News in Brief [S-M]
1230 Trans World Radio, Bonaire: News [M-A]
1245 Radio Berlin Int'l: News
1300 BBC: World News
1300 Belize Radio One: News
1300 Christian Science Monitor: News
1300 Christian Science Monitor: News [M-F]
1300 Radio Australia: World and Australian News
1300 Radio Berlin Int'l: News
1300 Radio Canada Int'l(Asia/Pacific):News [S-F]
1300 Radio Canada Int'l: News [S]
1300 Radio Finland: Northern Report [T-A]
1300 Radio Moscow (World Service): News
1300 Radio RSA: News
1300 Trans World Radio, Bonaire: News [S]
1300 Voice of America: News
1325 HCJB: News [M-F]
1330 Christian Science Monitor: News [M-F]
1330 Radio Moscow (World Service): News in Brief [S]
1330 Swiss Radio Int'l: News
1330 Voice of America: News (Special English)
1345 Radio Berlin Int'l: News
1352 Radio RSA: News in Brief
1400 BBC: News Summary [A-S]; Five-Minute News [M-F]
1400 Christian Science Monitor: News
1400 Radio Australia: International Report
1400 Radio Beijing: News
1400 Radio Japan: News [S-F]
1400 Radio Korea: News
1400 Radio Moscow (World Service): News
1400 Radio RSA: News
1400 Voice of America: News
1405 Radio Finland: Northern Report [T-A]
1410 Radio Beijing: News About China
1425 HCJB: News [M-F]
1430 Christian Science Monitor: News [M-F]
1430 Radio Moscow (World Service): News in Brief
1430 Radio Netherlands: News [M-A]
1445 Radio Berlin Int'l: News

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0734 Christian Science Monitor: Letterbox. See M 0334.
0745 BBC: Network UK. See T 0215.
1106 Christian Science Monitor: One Norway Street. See M 0306.
1113 Radio Australia: Window on Australia. See M 0113.
1115 BBC: New Ideas. See T 0445.
1125 BBC: Book Choice. See S 0745.
1130 BBC: Up the Garden Path. A dramatic serial revolving around Izzy, a vivacious young teacher.
1130 Radio Australia: Soundabout. See T 1130.
1134 Christian Science Monitor: Letterbox. See M 0334.
1206 Christian Science Monitor: News Focus. See M 0206.
1215 BBC: Multitrack 2. See W 1830.
1225 Radio Australia: Propagation Report. See S 0425.
1230 Radio Australia: Business Horizons. See T 0430.
1234 Christian Science Monitor: Kaleidoscope. See M 0234.
1245 BBC: Sports Roundup. See S 1330.
1245 Radio Australia: Music of Radio Australia. See S 0313.
1306 Christian Science Monitor: One Norway Street. See M 0306.
1309 BBC: Twenty-Four Hours. See S 0509.
1313 Radio Australia: Music of Radio Australia. See S 0313.
1330 BBC: Network UK. See T 0215.
1330 Radio Australia: Sports Results. See S 1330.
1334 Christian Science Monitor: Letterbox. See M 0334.
1345 BBC: Jazz Scene UK (September 7th, 21th) or Folk in Britain (September 14th, 28th). A look at jazz or folk music on the British Isles.
1345 Radio Australia: Music of Radio Australia. See S 0313.
1405 BBC: Outlook. See M 1405.
1406 Christian Science Monitor: News Focus. See M 0206.
1425 Radio Australia: Stock Exchange Report. See M 1425.
1430 BBC: Off the Shelf. See M 0430.
1430 Radio Australia: Window on Australia. See M 0113.
1434 Christian Science Monitor: Kaleidoscope. See M 0234.
1445 BBC: Write On... See H 0730.
1445 Radio Australia: Music of Radio Australia. See S 0313.
1506 Christian Science Monitor: One Norway Street. See M 0306.
1513 Radio Australia: Music of Radio Australia. See S 0313.
1515 BBC: The Pleasure's Yours. Gordon Clyde presents classical music requests.
1530 Radio Australia: Arts Roundabout. See S 0430.
1534 Christian Science Monitor: Letterbox. See M 0334.
1606 Christian Science Monitor: News Focus. See M 0206.
1615 BBC: Taking Issue. See H 0230.
1625 Radio Australia: Stock Exchange Report. See M 1425.
1627 Radio Australia: Propagation Report. See S 0425.
1630 Radio Australia: Music of Radio Australia. See S 0313.
1634 Christian Science Monitor: Kaleidoscope. See M 0234.
1645 BBC: The World Today. See M 1645.
1645 Radio Australia: Sports Results. See S 1330.
2306 Christian Science Monitor: One Norway Street. See M 0306.
2309 BBC: Commentary. See M 2309.
2313 Radio Australia: Music of Radio Australia. See S 0313.
2315 BBC: Music Review. Classical music events and developments from around the world.
2330 Radio Australia: Book Readings. See M 1345.
2334 Christian Science Monitor: Letterbox. See M 0334.
2345 Radio Australia: Boomerang. See S 0113.

Staff members on Radio Budapest's English Service: (from left) Edit Nagy, Gyorgyi Jakobi, Ilona Kiss, Charlie Coutts, Laszlo Pinter, Agnes Bielik, Vera Sarkany, Eszter Szamado, and Kornel Zipernovszky.

Friday

September 1, 8, 15, 22, 29

0006 Christian Science Monitor: News Focus. See M 0206.
0030 BBC: Oratorio. A look at the form of musical religious drama (except September 22nd, 29th: Verdi and his World, a look at the great operatic composer).
0030 Radio Australia: Music of Radio Australia. See S 0313.
0034 Christian Science Monitor: Kaleidoscope. See M 0234.
0101 BBC: Outlook. See M 1405.
0106 Christian Science Monitor: One Norway Street. See M 0306.
0113 Radio Australia: Window on Australia. See M 0113.
0125 BBC: Financial News. See T 0125.
0130 BBC: Jazz Scene UK (September 8th, 22nd) or Folk in Britain (September 1st, 15th, 29th). See H 1345.
0130 Radio Australia: Monitor. See S 2330.
0134 Christian Science Monitor: Letterbox. See M 0334.
0145 BBC: Talking From... Profiles from Northern Ireland, Scotland, and Wales.
0206 Christian Science Monitor: News Focus. See M 0206.
0209 BBC: British Press Review. See S 0209.
0215 BBC: Seven Seas. A weekly program about ships and the sea.
0230 BBC: Up the Garden Path. See H 1130.
0230 Radio Australia: Music of Radio Australia. See S 0313.

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1445 Radio Canada Int'l: News
1500 BBC: Newsreel
1500 Belize Radio One: News [M-A]
1500 Christian Science Monitor: News
1500 Deutsche Welle: World News
1500 Radio Australia: World and Australian News
1500 Radio Beijing: News
1500 Radio Japan: News [S-F]
1500 Radio Moscow (World Service): News
1500 Radio RSA: News
1500 Voice of America: News
1510 Radio Beijing: News About China
1525 HCJB: News [M-F]
1526 Radio Veritas Asia: World News [M-A]
1530 BRT, Brussels: News [M-S]
1530 Christian Science Monitor: News [M-F]
1530 Deutsche Welle: African News [M-F]
1530 Radio Moscow (World Service): News in Brief [S-M]
1530 Swiss Radio Int'l: News
1545 Radio Berlin Int'l: News
1552 Radio RSA: News in Brief
1600 BBC: World News
1600 Christian Science Monitor: News
1600 Deutsche Welle: World News
1600 Radio Australia: International Report
1600 Radio Korea: News
1600 Radio Moscow (World Service): News
1600 Radio Portugal: News [M-F]
1600 Voice of America: News
1609 BBC: News About Britain
1615 Radio Canada Int'l: News
1625 HCJB: News [M-F]
1630 Christian Science Monitor: News [M-F]
1630 Radio Moscow (World Service): News in Brief [S]
1630 Radio Netherlands: News [M-A]
1630 Voice of America (except Africa): News (Special English)
1700 BBC: World News
1700 Belize Radio One: News [M-F]
1700 Christian Science Monitor: News
1700 Kol Israel: News
1700 Radio Australia: World and Australian News
1700 Radio Japan: News [S-F]
1700 Radio Moscow (World Service): News
1700 Voice of America: News
1715 Radio Berlin Int'l: News
1730 BRT, Brussels: News
1730 Christian Science Monitor: News [M-F]
1730 Radio Berlin Int'l: News
1730 Radio Moscow (World Service): News in Brief
1730 Radio New Zealand Int'l: News [S-F]
1730 Swiss Radio Int'l: News
1800 BBC: Newsdesk
1800 Belize Radio One: Headline News [M-A]
1800 Christian Science Monitor: News
1800 Radio Australia: International Report
1800 Radio Canada Int'l: News
1800 Radio Korea: News
1800 Radio Moscow (World Service): News
1800 Radio New Zealand Int'l: News
1800 Radio RSA: News
1800 Voice of America: News
1803 Radio Jamahiriya, Libya: Headlines

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0234 Christian Science Monitor: Kaleidoscope. See M 0234.
0306 Christian Science Monitor: One Norway Street. See M 0306.
0313 Radio Australia: Music of Radio Australia. See S 0313.
0315 BBC: The World Today. See M 1645.
0330 BBC: Focus on Faith. Comment and discussion on the major issues in the worlds of faith.
0330 Radio Australia: Sports Results. See S 1330.
0334 Christian Science Monitor: Letterbox. See M 0334.
0345 Radio Australia: Music of Radio Australia. See S 0313.
0406 Christian Science Monitor: News Focus. See M 0206.
0425 Radio Australia: Propagation Report. See S 0425.
0430 BBC: Off the Shelf. See M 0430.
0430 Radio Australia: Matters of Faith. See S 1530.
0434 Christian Science Monitor: Kaleidoscope. See M 0234.
0445 BBC: Jazz Scene UK (September 8th, 22nd) or Folk in Britain (September 1st, 15th, 29th). See H 1345.
0445 Radio Australia: Music of Radio Australia. See S 0313.
0506 Christian Science Monitor: One Norway Street. See M 0306.
0509 BBC: Twenty-Four Hours. See S 0509.
0513 Radio Australia: Pacific Rap. See M 0513.
0530 BBC: Financial News. See T 0125.
0530 Radio Australia: Sports Results. See S 1330.
0533 Radio Australia: Window on Australia. See M 0113.
0534 Christian Science Monitor: Letterbox. See M 0334.
0540 BBC: Words of Faith. See S 0540.
0545 BBC: The World Today. See M 1645.
0545 Radio Australia: Pacific Requests. See T 0733.
0606 Christian Science Monitor: News Focus. See M 0206.
0630 BBC: Meridian. See W 0630.
0630 Radio Australia: Business Horizons. See T 0430.
0634 Christian Science Monitor: Kaleidoscope. See M 0234.
0645 Radio Australia: Music of Radio Australia. See S 0313.
0706 Christian Science Monitor: One Norway Street. See M 0306.
0709 BBC: Twenty-Four Hours. See S 0509.
0713 Radio Australia: Music of Radio Australia. See S 0313.
0730 BBC: Churchill at War. A look at Churchill's actions during the Second World War.
0730 Radio Australia: Sports Results. See S 1330.
0733 Radio Australia: Music of Radio Australia. See S 0313.
0734 Christian Science Monitor: Letterbox. See M 0334.
0745 Radio Australia: Pacific Spotlight. See W 0545.
1106 Christian Science Monitor: One Norway Street. See M 0306.

Lana Hale prepares tapes for her program on Vatican Radio's English Service,

1113 Radio Australia: Window on Australia. See M 0113.
1115 BBC: Talking From... See F 0145.
1130 BBC: Meridian. See W 0630.
1130 Radio Australia: International Top Hits. See S 1130.
1134 Christian Science Monitor: Letterbox. See M 0334.
1206 Christian Science Monitor: News Focus. See M 0206.
1215 BBC: Churchill at War. See F 0730.
1225 Radio Australia: Propagation Report. See S 0425.
1230 Radio Australia: Music of Radio Australia. See S 0313.
1234 Christian Science Monitor: Kaleidoscope. See M 0234.
1245 BBC: Sports Roundup. See S 1330.
1306 Christian Science Monitor: One Norway Street. See M 0306.
1309 BBC: Twenty-Four Hours. See S 0509.
1313 Radio Australia: Music of Radio Australia. See S 0313.
1330 BBC: John Peel. See T 0330.
1330 Radio Australia: Sports Results. See S 1330.
1334 Christian Science Monitor: Letterbox. See M 0334.
1345 Radio Australia: Music of Radio Australia. See S 0313.
1405 BBC: Outlook. See M 1405.
1406 Christian Science Monitor: News Focus. See M 0206.
1425 Radio Australia: Stock Exchange Report. See M 1425.
1430 BBC: Off the Shelf. See M 0430.
1430 Radio Australia: Window on Australia. See M 0113.
1434 Christian Science Monitor: Kaleidoscope. See M 0234.
1445 BBC: Nature Now. See M 0445.
1445 Radio Australia: Music of Radio Australia. See S 0313.
1506 Christian Science Monitor: One Norway Street. See M 0306.
1513 Radio Australia: Music of Radio Australia. See S 0313.
1515 BBC: Music Review. See H 2315.
1530 Radio Australia: Taim Bilong Masta. See T 0230.
1534 Christian Science Monitor: Letterbox. See M 0334.
1606 Christian Science Monitor: News Focus. See M 0206.
1615 BBC: Science in Action. See M 0230.
1625 Radio Australia: Stock Exchange Report. See M 1425.
1627 Radio Australia: Propagation Report. See S 0425.
1630 Radio Australia: Music of Radio Australia. See S 0313.
1634 Christian Science Monitor: Kaleidoscope. See M 0234.
1645 BBC: The World Today. See M 1645.
1645 Radio Australia: Sports Results. See S 1330.
2306 Christian Science Monitor: One Norway Street. See M 0306.
2309 BBC: Commentary. See M 2309.
2313 Radio Australia: Music of Radio Australia. See S 0313.
2315 BBC: Worldbrief. A roundup of the week's news headlines and human-interest happenings.
2330 BBC: Multitrack 3. Sarah Ward presents innovative and alternative rock music.
2334 Christian Science Monitor: Letterbox. See M 0334.

1830 Belize Radio One: Network News
1830 Christian Science Monitor: News [M-F]
1830 Radio Canada Int'l: News [M-F]
1830 Radio Finland: Northern Report [M-F]
1830 Radio Kuwait: News
1830 Radio Moscow (World Service): News in Brief [A-S]
1830 Radio Netherlands: News [M-A]
1830 Radio New Zealand Int'l: News [M-F]
1830 Swiss Radio Int'l: News
1830 Voice of America: News (Special English)
1847 Radio Jamahiriya, Libya: News
1852 Radio RSA: News in Brief
1900 BBC: News Summary
1900 Christian Science Monitor: News
1900 Deutsche Welle: World News
1900 HCJB: Latin American News [M-F]
1900 Kol Israel: News
1900 Radio Australia: World and Australian News
1900 Radio Canada Int'l: News [M-F]
1900 Radio Havana Cuba: Int'l News [M-A]
1900 Radio Japan: News
1900 Radio Moscow (World Service): News
1900 Radio New Zealand Int'l: News
1900 Radio Portugal: News [M-F]
1900 Radio RSA: News
1900 Spanish National Radio: News
1900 Voice of America: News
1915 Radio Berlin Int'l: News
1930 Christian Science Monitor: News [M-F]
1930 Radio Havana Cuba: Cuban National News [M-T]; Newsbreak [W-A]
1930 Radio Moscow (World Service): News in Brief [S]
1935 Radiotelevisione Italiana: News
1945 Radio Berlin Int'l: News
1950 HCJB: News [M-F]
2000 BBC: World News
2000 Christian Science Monitor: News
2000 Radio Australia: International Report
2000 Radio Havana Cuba: Int'l News [M-A]
2000 Radio Jordan: News
2000 Radio Moscow (World Service): News
2000 Radio New Zealand Int'l: News
2000 Radio RSA: News
2000 Voice of America: News
2000 Voice of Indonesia: News
2025 Radio Havana Cuba: Cuban National News [M-A]
2025 Radiotelevisione Italiana: News
2030 Christian Science Monitor: News [M-F]
2030 Radio Havana Cuba: News [M-A]
2030 Radio Korea: News
2030 Radio Moscow (World Service): News in Brief
2030 Radio Netherlands: News [M-A]
2052 Radio RSA: News in Brief
2055 Voice of Indonesia: News in Brief
2100 BBC: News Summary
2100 Belize Radio One: News [M-F]
2100 BRT, Brussels: News
2100 Christian Science Monitor: News
2100 Deutsche Welle: World News
2100 KVOH: UPI Radio News
2100 Radio Australia: World and Australian News
2100 Radio Berlin Int'l: News
2100 Radio Canada Int'l: News [A-S]; The World at Six [M-F]
2100 Radio Finland: Northern Report [M-F]

program guide

Saturday

September 2, 9, 16, 23, 30

0006 Christian Science Monitor: Herald of Christian Science. See S 0006.
0030 BBC: From the Weeklies. A review of the weekly British press.
0030 Radio Australia: Just Out. A look at recent Australian music releases.
0045 BBC: Recording of the Week. See M 0545.
0101 BBC: Outlook. See M 1405.
0106 Christian Science Monitor: Herald of Christian Science. See S 0006.
0113 Radio Australia: Music of Radio Australia. See S 0313.
0125 BBC: Financial News. See T 0125.
0130 BBC: Good as New. Julian Potter looks at restoration projects.
0130 Radio Australia: Australian Country Style. See M 0630.
0145 BBC: Book Choice. See S 0745.
0150 BBC: New Ideas. See T 0445.
0206 Christian Science Monitor: Herald of Christian Science. See S 0006.
0209 BBC: British Press Review. See S 0209.
0215 BBC: Network UK. See T 0215.
0230 BBC: People and Politics. Background to the British political scene.

Sara Manobla reviews the Israeli arts scene on "Studio Three." The program airs on Kol Israel's Thursday transmissions.

0230 Radio Australia: Book Readings. Serialized readings from popular books.
0306 Christian Science Monitor: Herald of Christian Science. See S 0006.
0313 Radio Australia: You Asked for It. See S 0713.
0315 BBC: The World Today. See M 1645.
0330 BBC: The Vintage Chart Show. Past top ten hits with Jimmy Savile.
0330 Radio Australia: Music of Radio Australia. See S 0313.
0406 Christian Science Monitor: Herald of Christian Science. See S 0006.
0425 Radio Australia: Propagation Report. See S 0425.
0430 BBC: Here's Humph! All that jazz with Humphrey Lyttelton.
0430 Radio Australia: Monitor. See S 2330.
0445 BBC: Personal View. See A 0030.
0506 Christian Science Monitor: Herald of Christian Science. See S 0006.
0509 BBC: Twenty-Four Hours. See S 0509.
0513 Radio Australia: Music of Radio Australia. See S 0313.
0530 BBC: Financial News. See T 0125.
0530 Radio Australia: Along the Mighty Murray. See W 1530.
0540 BBC: Words of Faith. See S 0540.
0545 BBC: The World Today. See M 1645.
0606 Christian Science Monitor: Herald of Christian Science. See S 0006.
0630 BBC: Meridian. See W 0630.
0630 Radio Australia: Just Out. See A 0030.
0706 Christian Science Monitor: Herald of Christian Science. See S 0006.
0709 BBC: Twenty-Four Hours. See S 0509.
0713 Radio Australia: AgriNews. News and information about agricultural and primary industries.
0730 BBC: From the Weeklies. See F 2315.
0730 Radio Australia: Business Horizons. See T 0430.
0745 BBC: Network UK. See T 0215.
1106 Christian Science Monitor: Herald of Christian Science. See S 0006.
1113 Radio Australia: Music of Radio Australia. See S 0313.
1115 BBC: Good as New. See A 0130.
1130 BBC: Meridian. See W 0630.
1130 Radio Australia: Soundabout. See T 1130.
1206 Christian Science Monitor: Herald of Christian Science. See S 0006.
1215 BBC: Multitrack 3. See F 2330.
1225 Radio Australia: Propagation Report. See S 0425.
1230 Radio Australia: International Country Music. See M 0230.
1245 BBC: Sports Roundup. See S 1330.
1306 Christian Science Monitor: Herald of Christian Science. See S 0006.
1309 BBC: Twenty-Four Hours. See S 0509.
1313 Radio Australia: You Asked for It. See S 0713.
1330 BBC: Network UK. See T 0215.
1330 Radio Australia: Sports Results. See S 1330.
1345 BBC: Sportsworld. Paddy Feeny presents almost three hours of live sports.
1345 Radio Australia: Music of Radio Australia. See S 0313.
1401 BBC: Sportsworld (continued). See A 1345.
1406 Christian Science Monitor: Herald of Christian Science. See S 0006.
1430 Radio Australia: Boomerang. See S 0113.
1445 Radio Australia: Music of Radio Australia. See S 0313.
1506 Christian Science Monitor: Herald of Christian Science. See S 0006.
1513 Radio Australia: AgriNews. See A 0713.
1515 BBC: Sportsworld (continued). See A 1345.
1530 Radio Australia: This Australia. See M 0130.
1606 Christian Science Monitor: Herald of Christian Science. See S 0006.
1615 BBC: Sportsworld (continued). See A 1345.
1627 Radio Australia: Propagation Report. See S 0425.
1630 Radio Australia: Music of Radio Australia. See S 0313.
1645 Radio Australia: Sports Results. See S 1330.
2306 Christian Science Monitor: Herald of Christian Science. See S 0006.
2309 BBC: Book Choice. See S 0745.
2313 Radio Australia: Music of Radio Australia. See S 0313.
2315 BBC: A Jolly Good Show. See T 1515.
2330 Radio Australia: Innovations. See S 1430.

Suggestions? Something missing?

Let us know your corrections, suggestions and additions by sending them to Program Manager Kannon Shanmugan at 4412 Turnberry Circle, Lawrence, Kansas 66047.

news guide cont'd from p.63

2100 Radio Japan: News
2100 Radio Moscow (World Service): News
2100 Spanish National Radio: News
2100 Swiss Radio Int'l: News
2100 Voice of America: News
2130 Christian Science Monitor: News [M-F]
2130 Kol Israel: News
2130 KVOH: UPI Headline News
2130 Radio Canada Int'l (Africa): News
2130 Radio Canada Int'l: As It Happens [M-F]
2130 Radio Moscow (World Service): News in Brief [A-S]
2130 Swiss Radio Int'l: News
2145 Radio Berlin Int'l: News
2200 BBC: Newshour
2200 Christian Science Monitor: News
2200 KVOH: UPI Radio News
2200 Radio Australia: International Report
2200 Radio Canada Int'l (Asia/Pacific): News
2200 Radio Canada Int'l: News [A-S]; The World at Six [M-F]
2200 Radio Havana Cuba: Int'l News [M-A]
2200 Radio Moscow: News
2200 Radiotelevisione Italiana: News
2200 Voice of America: News
2200 Voice of Free China: News and Commentary
2230 Christian Science Monitor: News [M-F]
2230 KVOH: UPI Headline News
2230 Radio Havana Cuba: Cuban National News [M-A]
2230 Radio Moscow (World Service): News in Brief [A-S]
2230 Radio Polonia: News
2230 Voice of America: News (Special English)
2300 BBC: World News
2300 Belize Radio One: News [M-F]
2300 Christian Science Monitor: News
2300 Kol Israel: News
2300 KVOH: UPI Radio News
2300 Radio Australia: World and Australian News
2300 Radio Canada Int'l: News
2300 Radio for Peace Int'l: News [F]
2300 Radio Japan: News [S-F]
2300 Radio Moscow: News
2300 Radio New Zealand Int'l: News
2300 Voice of America: News
2300 Voice of Turkey: News
2330 BRT, Brussels: News
2330 Christian Science Monitor: News [M-F]
2330 KVOH: UPI Headline News
2330 Radio Canada Int'l: As It Happens [M-F]; News [A]
2330 Radio for Peace Int'l: News [M]
2330 Radio Kiev: News
2330 Radio Korea: News
2330 Radio Moscow (World Service): News in Brief [M]
2330 Radio New Zealand Int'l: News [S-H]
2335 Voice of Greece: News [S]
2345 Radio Berlin Int'l: News

MT Monitoring Team

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Winston-Salem, NC 27127

Joe Hanlon
Philadelphia, PA

Richard A. Keen
Golden, Colorado

frequency section

0000 UTC [8:00 PM EDT/5:00 PM PDT]

0000-0030		BBC, London, England	5975	6005	6175	7325
			9590	9915	12095	15260
			15310	15360	17875	
0000-0030		Kol Israel, Jerusalem	11605	15615	15640	
0000-0030		Radio Berlin Int'l, East Germany	6080	11890		
0000-0030		Radio Korea (South), Seoul	15575			
0000-0030	M	Radio Norway, Oslo	11845			
0000-0045		Radio Yugoslavia, Belgrade	9620	11735	15105	
0000-0045		WINB, Red Lion, Pennsylvania	15145			
0000-0050		Radio Pyongyang, North Korea	15115	15160		
0000-0055		Radio Beijing, PR China	15130	17715	17855	
0000-0100		All India Radio, New Delhi	6055	7215	9535	9910
			11715	11745	15110	
0000-0100		Adventist World Radio, Costa Rica	11870			
0000-0100		CBC Northern Quebec Service	6195	9625		
0000-0100		CBN, St. John's, Newfoundland	6160			
0000-0100		CBU, Vancouver, British Colombia	6160			
0000-0100		CFCF, Montreal, Quebec	6005			
0000-0100		CFCN, Calgary, Alberta	6030			
0000-0100		CHNS, Halifax, Nova Scotia	6130			
0000-0100		Christian Science World Service	7400	9850	13760	
0000-0100		CKWX, Vancouver, British Colombia	6080			
0000-0100		CFRB, Toronto, Ontario	6070			
0000-0100		FEBC, Manila, Philippines	15445			
0000-0100		KSDA, Guam	15125			
0000-0100	T-A	KVOH, Rancho Simi, California	17775			
0000-0100		Radio Australia, Melbourne	15140	15160	15240	15320
			17750	17795	21740	
0000-0100		Radio Canada Int'l, Montreal	5960	9755		
0000-0100		Radio Havana Cuba	11820			
0000-0100		Radio Luxembourg	6090			
0000-0100		Radio Moscow	11845	12025	17655	17880
			21585	21690	21790	
0000-0100		Radio Moscow N. America Service	9530	9765	11710	11730
			11750	11850	11930	13605
			15290	15330		
0000-0100		Radio New Zealand, Wellington	15485	17705		
0000-0100		Radio for Peace, Costa Rica	13660	21565		
0000-0100		Radio Thailand, Bangkok	9655	11905		
0000-0100		Radio Tonga, Tonga	5050			
0000-0100		SBC Radio One, Singapore	5010	5052	11940	
0000-0100		Spanish Foreign Radio, Madrid	9630	15110		
0000-0100	T-S	Superpower KUSW, Utah	15580			
0000-0100		Voice of America, Washington	5995	6130	9455	9775
			9815	11580	11695	11740
			15205			
0000-0100		WHRI, Noblesville, Indiana	7365	9495		
0000-0100		WRNO, New Orleans, Louisiana	7355			
0000-0100		WYFR, Oakland, California	5985	9505	15170	
0030-0045		BBC, London, England*	6195	7235	9570	11945
			15360	17875		
0030-0100		BBC, London, England	5975	6005	6175	7325
			9515	9580	9915	9590
			11955	12095	15260	
0030-0100		HCJB, Quito, Ecuador	9745	11775	15155	15230
0030-0100		Radio Budapest, Hungary	6110	9520	9585	9835
			11910	15160		
0030-0100		Radio Netherlands, Hilversum	6020	6165	15315	
0030-0100		SLBC, Colombo, Sri Lanka	6005	9720		
0035-0040		All India Radio, New Delhi	3925	4860		
0045-0100		Radio Korea (South), Seoul	15575			
0045-0100		Radio New Zealand, Wellington	15150	17705		
0048-0100		WINB, Red Lion, Pennsylvania	15145			
0050-0100		Vatican Radio, Vatican City	9605	11780	15185	

0100 UTC [9:00 PM EDT/6:00 PM PDT]

0100-0110		Vatican Radio, Vatican City	9605	11780	15180	
0100-0115		All India Radio, New Delhi	6055	7215	9535	9910
			11715	11745	15110	
0100-0120		RAI, Rome, Italy	9575	11800		
0100-0125		Radio Netherlands, Hilversum	6020	6165	15315	
0100-0130		Kol Israel, Jerusalem	11605	15615	15640	
0100-0130		Radio Canada Int'l, Montreal	9535	11845	11940	13720

LEGEND

* The first four digits of an entry are the broadcast start time in UTC. The second four digits represent the end time.
* In the space between the end time and the station name is the broadcast schedule.

S=Sunday M=Monday T=Tuesday W=Wednesday
H=Thursday F=Friday A=Saturday

If there is no entry, the broadcasts are heard daily. If, for example, there is an entry of "M," the broadcast would be heard only on Mondays. An entry of "M,W,F" would mean Mondays, Wednesdays and Fridays only. "M-F" would mean Mondays through Fridays. "TEN" indicates a tentative schedule and "TES" a test transmission.

* [ML] after a frequency indicates a multi-lingual transmission containing English-language programs.
* The last entry on a line is the frequency. Codes here include "SSB" which indicates a Single Sideband transmission, and "V" for a frequency that varies. [ML] after a frequency indicates a multi-lingual transmission containing English-language programs.
* v after a frequency indicates that it varies
* Notations of USB and LSB (upper and lower sideband transmissions) usually refer only to the individual frequency after which they appear.
* Listings followed by an asterisk (*) are for English lessons and do not contain regularly scheduled programming.

We suggest that you begin with the lower frequencies that a station is broadcasting on and work your way up the dial. Remember that there is no guarantee that a station will be audible on any given day. Reception conditions can change rapidly, though, and if it is not audible one night, it may well be on another.

HOW TO USE THE PROPAGATION CHARTS

Propagation charts can be an invaluable aid to the DXer in determining which frequencies are likely to be open at a given time. To use the propagation charts, choose those for your location (the are divided into east coast, midwest and west coast of North America). Then look for the one most closely describing the geographic location of the station you want to hear.

Once you've located the correct charts, look along the horizontal axis of the graph for the time that you are listening. The top line of the graph shows the Maximum Useable Frequency [MUF] and the lower line the Lowest Useable Frequency [LUF] as indicated on the vertical axis of the graph.

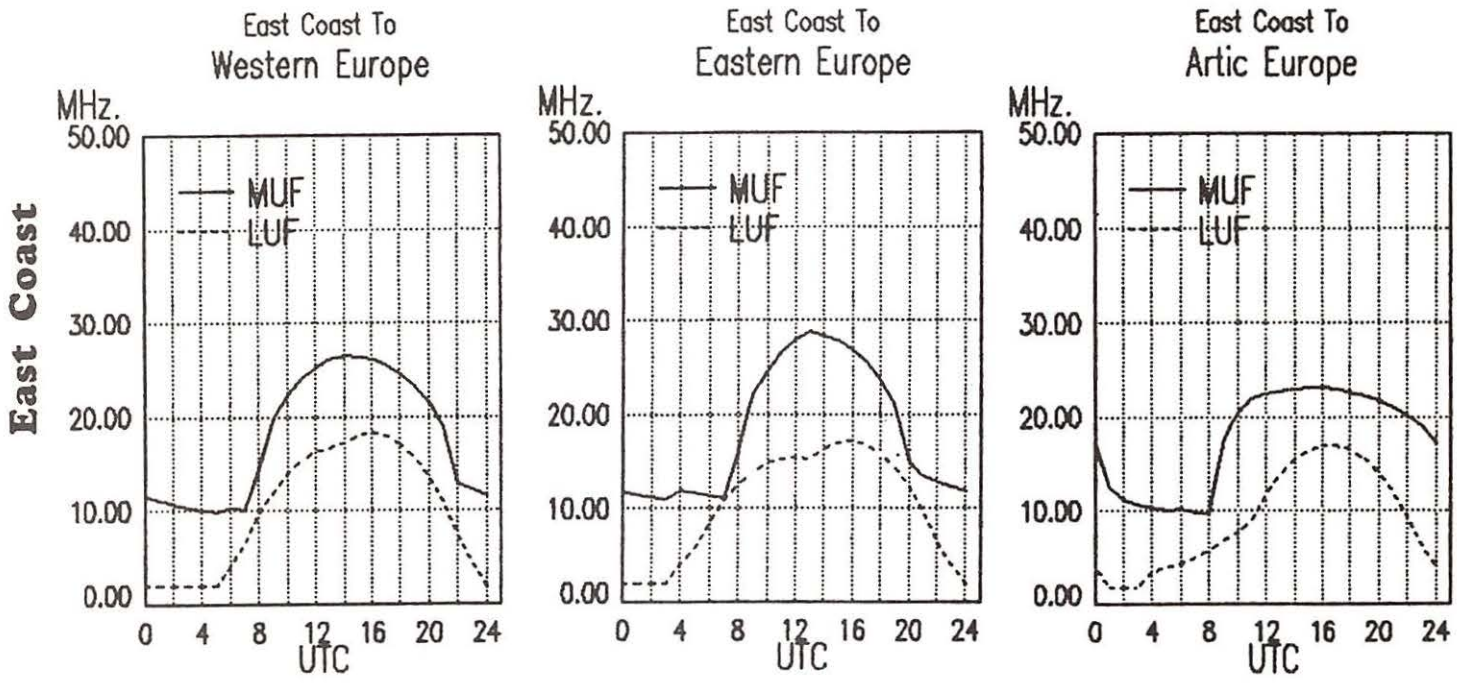
While there are exceptions to every rule (especially those regarding shortwave listening), you should find the charts helpful in determining the best times to listen for particular regions of the world. Good luck!

frequency section

0100-0130		Radio Japan, Tokyo	17825			
0100-0130		Radio Sweden, Stockholm	15405	17800		
0100-0130		Laotian National Radio	7113v			
0100-0130	S,M	WINB, Red Lion, Pennsylvania	15145			
0100-0145		Radio Berlin Int'l, East Germany	6080	11890		
0100-0150		Deutsche Welle, West Germany	6040	6085	6145	9565
			9735	11865	15105	
0100-0200		BBC, London, England	5975	6005	6175	7325
			9410	9590	9915	12095
			15260	17815		
0100-0200		CBC Northern Quebec Service	6195	9625		
0100-0200		CBN, St. John's, Newfoundland	6160			
0100-0200		CBU, Vancouver, British Colombia	6160			
0100-0200		CFCF, Montreal, Quebec	6005			
0100-0200		CFCN, Calgary, Alberta	6030			
0100-0200		CHNS, Halifax, Nova Scotia	6130			
0100-0200		Christian Science World Service	7400	9850	13760	
0100-0200		CKWX, Vancouver, British Colombia	6080			
0100-0200		CFRB, Toronto, Ontario	6070			
0100-0200		FEBC, Manila, Philippines	15445			
0100-0200		HCJB, Quito, Ecuador	9745	11775	15155	15230
0100-0200	T-A	KVOH, Rancho Simi, California	17775			
0100-0200		Radio Australia, Melbourne	15160	15180	15240	15320
			15395	17715	17795	
			17750	21740		
0100-0200		Radio Havana Cuba	11820			
0100-0200		Radio Japan, Tokyo	5960	17810	17835	17845
0100-0200		Radio Luxembourg	6090			
0100-0200		Radio Moscow	11845	15590	17600	17655
			17825	17850	17860	17880
			17890	21585	21690	21790
0100-0200		Radio Moscow, N. American Service	9530	9765	11710	11730
			11750	11850	11930	15280
			15290	15330	15425	
0100-0200		Radio New Zealand, Wellington	15485	17705		
0100-0200	T-A	Radio for Peace, Costa Rica	13660	21565	25945(A)	
0100-0200		Radio Prague, Czechoslovakia	5930	7345	9540	9625
			11685	11990	13715	15540
0100-0200		Radio Thailand, Bangkok	9655	11905		
0100-0200		Radio Tonga, Tonga	5050			
0100-0200		RAE, Buenos Aires, Argentina	9690			
0100-0200		SBC Radio One, Singapore	5052	11940		
0100-0200		SLBC, Colombo, Sri Lanka	6005	9720	15425	
0100-0200		Spanish Foreign Radio, Madrid	9630	15110		
0100-0200	T-S	Superpower KUSW, Utah	11695			
0100-0200		Voice of America, Washington	5995	6130	7205	9455
			9740	9775	9815	11580
			11740	15160	15205	17735
			18157	USB		
0100-0200		Voice of Indonesia, Jakarta	9680	11790		
0100-0200		WHRI, Noblesville, Indiana	7365	9495		
0100-0200		WRNO New Orleans, Louisiana	7355			
0100-0200	IRR	WWCR, Nashville, Tennessee	15690			
0100-0200		WYFR, Oakland, California	5985	9505	15170	
0130-0140	T-S	Voice of Greece, Athens	9395	9420	11645	
0130-0145	WHFA M	Radio Budapest, Hungary	6110	9520	9585	9835
			11910	15160		
0130-0155		Radio Austria Int'l, Vienna	9870	9875	13730	
0130-0200		Radio Baghdad, Iraq	11810	11945		
0130-0200	S,M	Radio Canada Int'l, Montreal	9535	11845	11940	13720
0130-0200		Radio Veritas Asia, Philippines	15330	15365		
0130-0200		WINB, Red Lion, Pennsylvania	15145			
0145-0200		Radio Berlin Int'l, East Germany	6080	11785	11890	15125

0200 UTC [10:00 PM EDT/7:00 PM PDT]

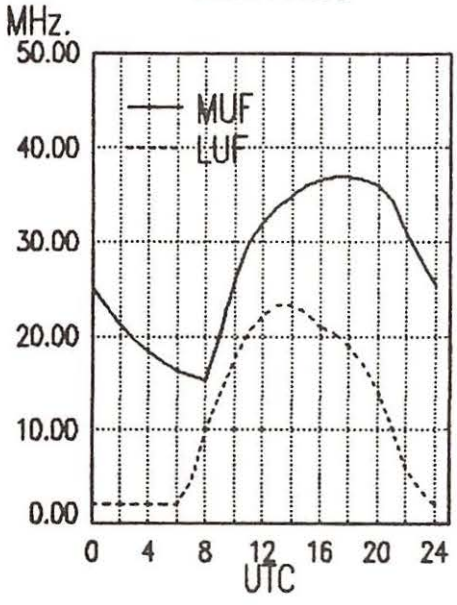
0200-0205	T-A	KVOH, Rancho Simi, California	17775			
0200-0215		Vatican Radio, Vatican City	6145	7125	9650	
0200-0230		Burma Bcasting Service, Rangoon	7185			
0200-0230		Radio Berlin Int'l, East Germany	6080	11785	11890	15125
0200-0230		Radio Kiev, Ukrainian SSR	11675	11790	12000	15180
			15455			
0200-0230		Swiss Radio Int'l, Berne	6095	6135	9725	9885
			12035	17730		
0200-0250		Deutsche Welle, West Germany	6035	7285	9690	11945
			15205	15235	17770	
0200-0250		Radio Bras, Brasilia, Brazil	11745v			
0200-0255		Radio Bucharest, Romania	6155	9510	9570	11830
			11940	15380		
0200-0300		BBC, London, England	5975	6005	6175	7325
			9410	9590	9660	9915
			12095	15260	15310	17875
0200-0300		CBC Northern Quebec Service	6195	9625		
0200-0300		CBN, St. John's, Newfoundland	6160			
0200-0300		CBU, Vancouver, British Colombia	6160			
0200-0300		CFCF, Montreal, Quebec	6005			
0200-0300		CFCN, Calgary, Alberta	6030			
0200-0300		CFRB, Toronto, Ontario	6070			



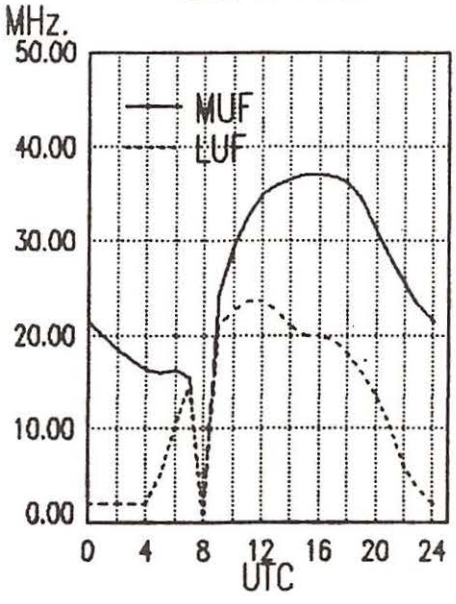
0200-0300		CHNS, Halifax, Nova Scotia	6130
0200-0300		Christian Science World Service	9455 9850 13760
0200-0300		CKWX, Vancouver, British Colombia	6080
0200-0300		HCJB, Quito, Ecuador	9745 11775 15155
0200-0300	A,S	KSDA, Guam	17865
0200-0300		Radio Australia, Melbourne	15160 15180 15240 15320 15395 17715 17750 17795 21740
0200-0300		Radio Baghdad, Iraq	11810 11945
0200-0300		Radio Cairo, Egypt	9475 9675
0200-0300	T-A	Radio Canada Int'l, Montreal	9535 9755 11845 11940
0200-0300		Radio Havana Cuba	9710 11820
0200-0300		Radio Luxembourg	6090
0200-0300		Radio Moscow, USSR	12025 13745 15140 15280 17600 17620 21585 21690 21790
0200-0300		Radio Moscow N. America Service	9530 9765 11710 11730 11850 11930 15290 15330 15425 15540 17860
0200-0300		Radio Orion, South Africa	3955
0200-0300	T-A	Radio for Peace, Costa Rica	13660 21565 25945(A)
0200-0300	A	Radio New Zealand, Wellington	15485 17705
0200-0300		Radio RSA, South Africa	6010 9580 9615
0200-0300		Radio Thailand, Bangkok	9655 11905
0200-0300		Radio Tonga, Tonga	5050
0200-0300		SBC Radio One, Singapore	5052 11940
0200-0300		SLBC, Colombo, Sri Lanka	6005 9720 15425
0200-0300	T-S	Superpower KUSW, Utah	11695
0200-0300		Voice of America, Washington	5995 6035 6135 7205 9740 9775 9815 11580 15160 15205 18157 USB
0200-0300		Voice of Asia, Taiwan	7285
0200-0300		Voice of Free China, Taiwan	5950 7445 9680 9765 11740 11860 15345
0200-0300		Voice of Kenya, Nairobi	6045
0200-0300		WINB, Red Lion, Pennsylvania	15145
0200-0300		WHRI, Noblesville, Indiana	7365 9495
0200-0300		WRNO, New Orleans, Louisiana	7355
0200-0300	IRR	WWCR, Nashville, Tennessee	15690
0200-0300		WYFR, California	5985 9505 15170
0215-0220		Radio Nepal, Kathmandu	5005 7165
0230-0240		Port Moresby, Papua New Guinea	3925 4890 5960 5985 6020 6040 6080 6140 9520

0230-0245		Radio Pakistan, Islamabad	7010 11570 15115 15580 17660
0230-0300		Radio Berlin Int'l, E. Germany	9730 13610 15240
0230-0300		Radio Finland, Helsinki	11755 15185
0230-0300	T-A	Radio Portugal, Lisbon	6060 6080 9600 9680 9705 11840

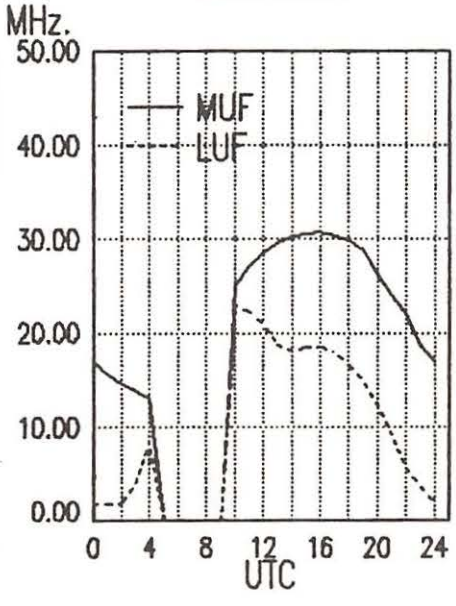
East Coast To West Africa



East Coast To Central Africa



East Coast To East Africa



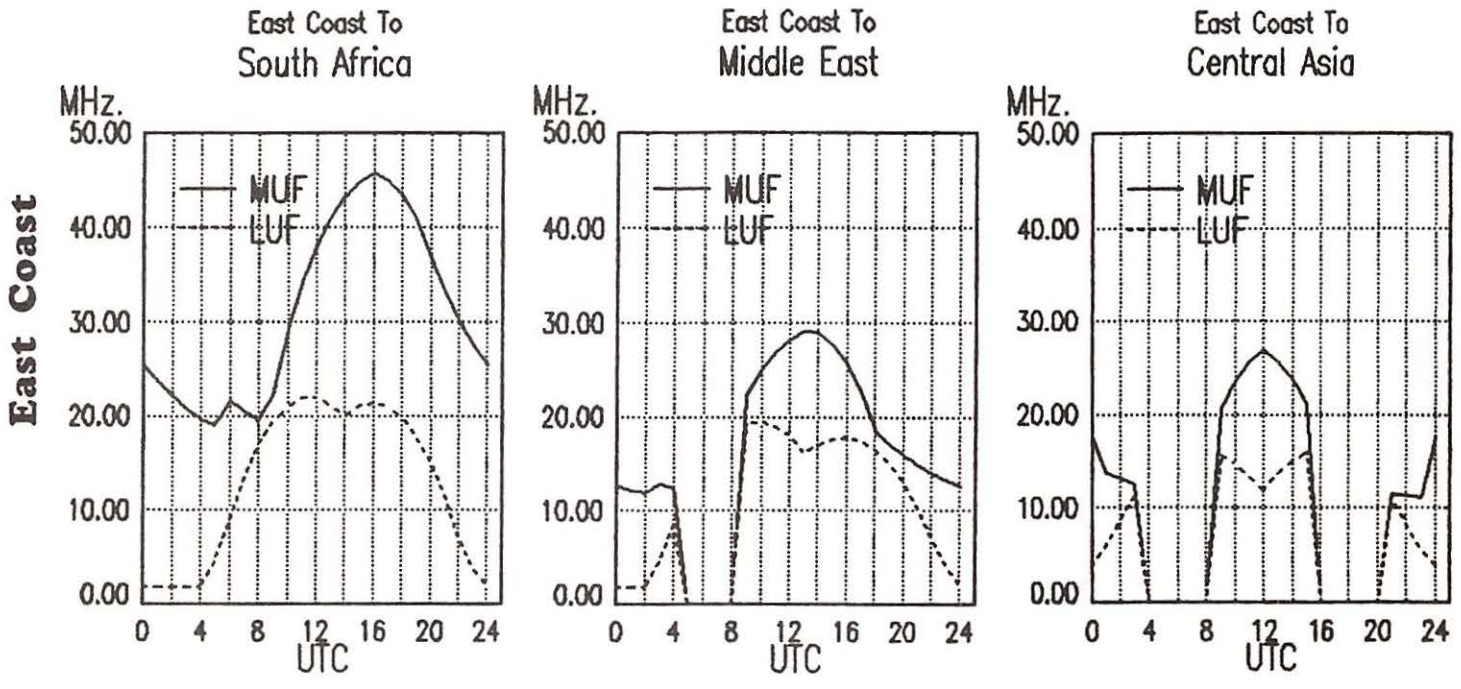
East Coast

frequency section

0240-0250	All India Radio, New Delhi	3905	4860	4880	4895
		5960	5990	6110	6120
		7195	7295	9550	9610
		11830	11870	15305	
0245-0300	Radio Korea, Seoul, South Korea	9640	15575		
0252-0257v	Radio Yerevan, Armenian SSR	11675	15180	15455	

0300 UTC [11:00 PM EDT/8:00 PM PDT]

0300-0315	Radio Berlin Int'l, E. Germany	6125	11750	13610	
0300-0330	WINB, Red Lion, Pennsylvania	15145			
0300-0307	Radio Pakistan, Islamabad	5090	5930	7095	
0300-0330	BBC, London, England	3955	5975	6005	6175
		6195	7325	9410	9915
		12095	15260	15420	17815
0300-0330	Radio Cairo, Egypt	9475	9675		
0300-0330	Radio Japan, Tokyo	7125	15325	17765	17825
		17835			
0300-0330	Radio Sweden Int'l, Stockholm	9695	11705		
0300-0345	Radio Berlin Int'l, East Germany	11785	15125		
0300-0345 A	Radio New Zealand, Wellington	15485	17705		
0300-0350	Deutsche Welle, West Germany	6085	9545	9605	9700
		11810	15205		
0300-0350	Radio Baghdad, Iraq	11810	11945		
0300-0355	Radio Beijing, China	9690	11715	15130	15510
		17855			
0300-0400	CBC Northern Quebec Service	6195	9625		
0300-0400	CBN, St. John's, Newfoundland	6160			
0300-0400	CBU, Vancouver, British Colombia	6160			
0300-0400	CFCF, Montreal, Quebec	6005			
0300-0400	CFCN, Calgary, Alberta	6030			
0300-0400	CHNS, Halifax, Nova Scotia	6130			
0300-0400	Christian Science World Service	9455	9850	13760	
0300-0400	CKWX, Vancouver, British Colombia	6080			
0300-0400	CFRB, Toronto, Ontario	6070			
0300-0400	HCJB, Quito, Ecuador	9745	11775	15155	
0300-0400	La Voz Evangelica, Honduras	4820			
0300-0400	Radio Australia, Melbourne	11945	15160	15240	15320
		15395	17715	17750	17795
		21740			
0300-0400	Radio Havana Cuba	9710	11820		
0300-0400	Radio Japan, Tokyo	17765	17810	17835	
0300-0400	Radio Moscow, USSR	9530	9765	11675	11710
		11845	11850	11930	15180
		15280	17600	17620	21585
		21625	21690	21790	
0300-0400 T-A	Radio for Peace, Costa Rica	13660v	21565		
0300-0400	Radio Prague, Czechoslovakia	5930	7345	9540	11685
		11990	13715	15540	
0300-0400	Radio Sofia, Bulgaria	15160	15290	17825	
0300-0400	Radio Thailand, Bangkok	9655	11905		
0300-0400	SBC Radio One, Singapore	5052	11940		
0300-0400	SLBC, Colombo, Sri Lanka	6005	9720	15425	
0300-0400 T-S	Superpower KUSW, Utah	9815			
0300-0400	Trans World Radio, Bonaire	9535	11930		
0300-0400	Voice of America, Washington	5995	6035	7280	9525
		9575	11835		
0300-0400	Voice of Free China, Taiwan	5950	7445	9680	11745
		15345			
0300-0400	Voice of Kenya, Nairobi	6045			
0300-0400	Voice of Turkey, Ankara	9445	17760		
0300-0400	WHRI, Noblesville, Indiana	7365	9495		
0300-0400	WMLK, Bethel, Pennsylvania	9465			
0300-0400	WRNO, New Orleans, Louisiana	6185			
0300-0400 IRR	WWCR, Nashville, Tennessee	7520			
0300-0400	WYFR Satellite Net, California	5985	9505	15566	
0310-0330	Vatican Radio, Vatican City	11725			
0315-0345	Radio France Int'l, Paris	3965	5990	7135	7280
		9550	9745	9790	11670
		11700	11790	11995	15135
		15300			
0330-0400	BBC, London, England	3955	5975	6005	6175
		6195	9410	9915	12095
		17815			
0330-0400	Radio Netherland, Hilversum	6165	9590		
0330-0400 S,M	WINB, Red Lion, Pennsylvania	15145			
0335-0400	Radio New Zealand, Wellington	15150	17705		
0330-0400	Radio Tanzania, Dar es Salaam	9684			
0330-0400	Radio Tirana, Albania	9500			
0330-0400	United Arab Emirates Radio	11940	15435	15555	17890
0335-0340	All India Radio, New Delhi	3905	4860	9610	11830
		11870	11890	15305	
0340-0350 M-A	Voice of Greece, Athens	7430	9395	9420	
0345-0400	Radio Berlin Int'l, East Germany	11785	15125		
0350-0400	RAI, Rome, Italy	15330	17795	21610	



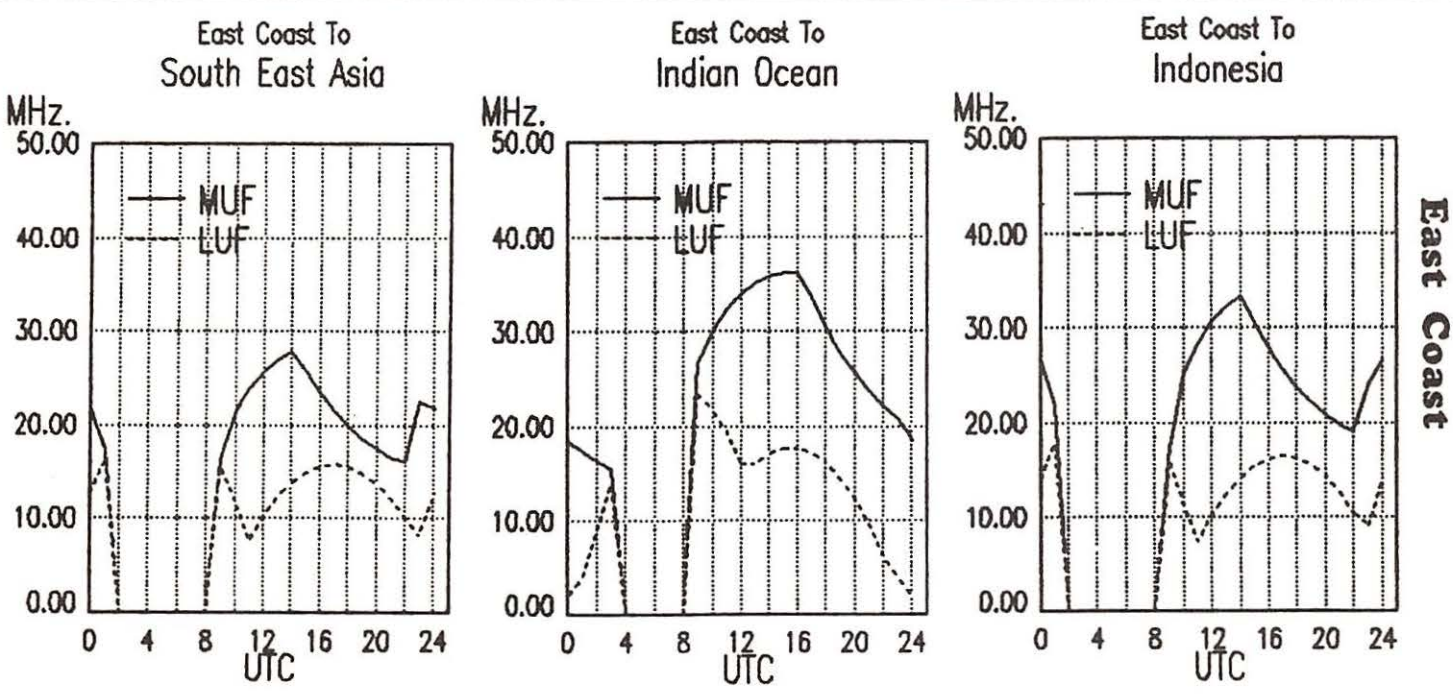
frequency section

0400 UTC [12:00 AM EDT/9:00 PM PDT]

0400-0405		Radio Uganda, Kampala	4976 5026
0400-0410		Radio Thailand, Bangkok	9655 11905
0400-0410		RAI, Rome, Italy	6155 11905 15330
0400-0415		Kol Israel, Jerusalem	11655 15640 17575 17630 17685
0400-0420		Radio Botswana, Gabarone	4820
0400-0420	T-S	Radio Zambia, Lusaka	3345 6165
0400-0425		Radio Bucharest, Romania	6155 9510 9570 11830 11940 15380
0400-0425		Radio Netherland, Hilversum	6165 9590
0400-0430		BBC, London, England	3955 5975 6005 6195 7105 9410 9540 9580 9600 9915 12095 15070 15420 17815 17885
0400-0430		La Voz Evangelica, Honduras	4820
0400-0430		Radio Berlin Int'l, East Germany	11785 15125
0400-0430		SLBC, Colombo, Sri Lanka	6005 9720 15425
0400-0430		Radio Tanzania, Dar es Salaam	9684
0400-0430		Swiss Radio Int'l, Berne	6135 9725 9885 12035
0400-0430		Trans World Radio, Bonaire	9535 11930
0400-0430	S,M	WINB, Red Lion, Pennsylvania	15145
0400-0450		Deutsche Welle, West Germany	7150 7225 9565 9765 15265
0400-0450		Radio Pyongyang, North Korea	15160 15180
0400-0455		Radio Beijing, China	11685 11840 15195
0400-0500		CBC Northern Quebec Service	6195 9625
0400-0500		CBN, St. John's, Newfoundland	6160
0400-0500		CBU, Vancouver, British Colombia	6160
0400-0500		CFCF, Montreal, Quebec	6005
0400-0500		CFCN, Calgary, Alberta	6030
0400-0500		CHNS, Halifax, Nova Scotia	6130
0400-0500		Christian Science World Service	9455 9870 13760
0400-0500		CKWX, Vancouver, British Colombia	6080
0400-0500		CFRB, Toronto, Ontario	6070
0400-0500		FEBC, Manila, Philippines	11850
0400-0500		HCJB, Quito, Ecuador	11775 15155 15185
0400-0500		Radio Australia, Melbourne	11910 15160 15240 15320 17715 17795 21740
0400-0500		Radio Havana Cuba	5965 9710 11760 11820
0400-0500		Radio Moscow, USSR	9765 11675 15320 15425 15455 15480 15540 17635 17860 17880 21585 21625 21690
0400-0500		Radio Moscow North America Svc	15405 15425 15540
0400-0500		Radio New Zealand, Wellington	15485 17705
0400-0500		Radio for Peace, Costa Rica	7375t 13660v 21565
0400-0500		Radio Tonga, Tonga	5050
0400-0500		Radio 5, South Africa	4880 11880
0400-0500		SBC Radio One, Singapore	5052 11940
0400-0500	T-S	Superpower KUSW, Utah	9815
0400-0500		Voice of America, Washington	3980 5995 6030 6040 7170 7200 7280 9525 9540 9575 11835 15205 15275
0400-0500		Voice of Kenya, Nairobi	6045
0400-0500	V	Voice of Nicaragua, Managua	6100
0400-0500		WHRI, Noblesville, Indiana	7365 9495
0400-0500		WMLK, Bethel, Pennsylvania	9465
0400-0500		WRNO, New Orleans, Louisiana	6185
0400-0500		WYFR Satellite Net, California	5985 9520
0425-0440		RAI, Rome, Italy	5990 7275
0430-0455		Radio Netherlands, Hilversum	9895 13700
0430-0500		BBC, London, England	3955 5975 6005 7185 9410 9510 9580 9600 9915 12095 15070 15280 15245 15420 17815
0430-0500		BBC, London, England*	7210 9750 11945
0430-0500		Radio Tirana, Albania	9480 11835
0430-0500	S,M	Trans World Radio, Bonaire	9535 11930
0430-0500		Trans World Radio, Swaziland	3205 7205
0432-0500	A,M	FEBA, Seychelles	15325 17820 (irr)

0500 UTC [1:00 AM EDT/10:00 PM PDT]

0500-0510		Radio Lesotho, Maseru	4800
0500-0510	M-A	Radio Zambia, Lusaka	3345 6165
0500-0515		GBC, Accra, Ghana	4915
0500-0515		Vatican Radio, Vatican City	9645 11740 15190
0500-0530	S,M	Trans World Radio, Bonaire	9535 11930
0500-0530		Trans World Radio, Swaziland	3205 5055 7210
0500-0545		Radio Berlin Int'l, East Germany	5965 6115 9645 11810 13610
0500-0550		Deutsche Welle, West Germany	6130 9670 9700 9845 11705 11845

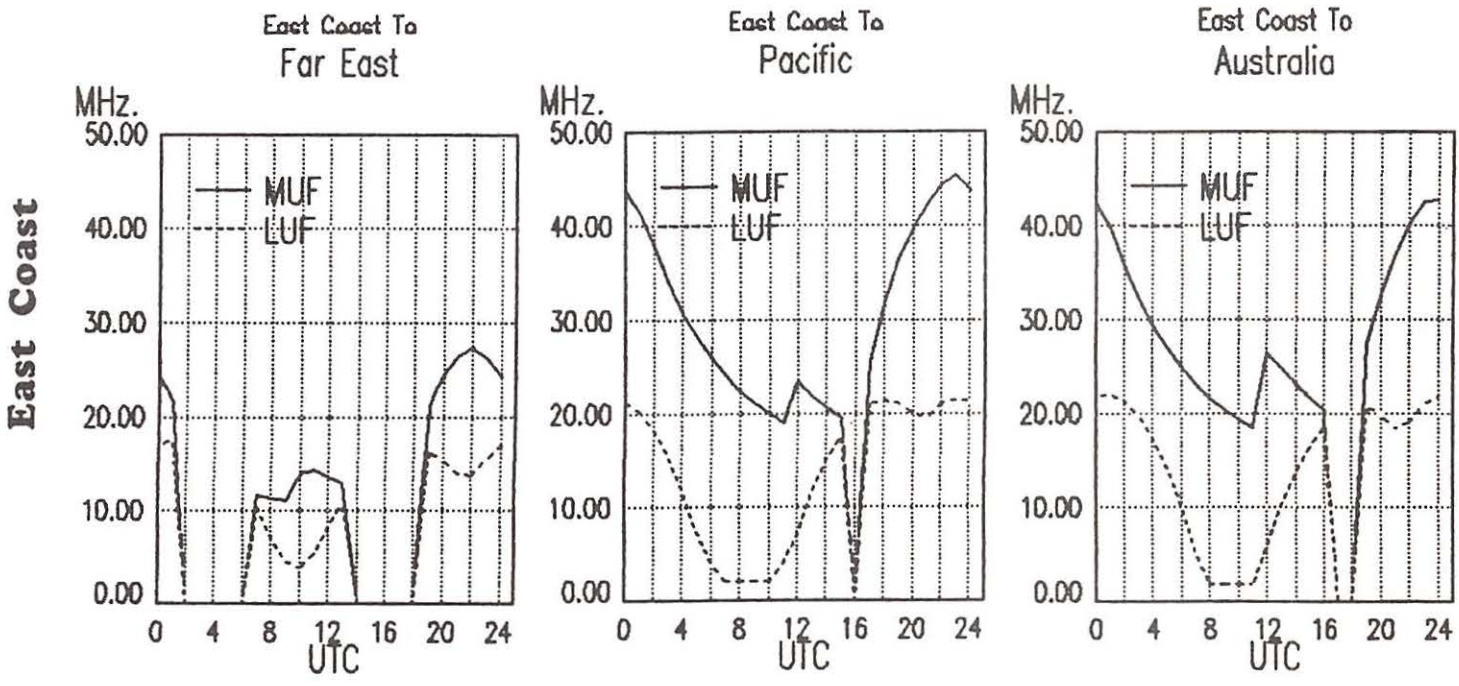


frequency section

0500-0600		BBC, London, England	5975	6005	6195	9410
			9510	9600	9640	9915
			12095	15070	15280	17740
			17815	17885	21470	
0500-0600		CBC Northern Quebec Service	6195	9625		
0500-0600		CBU, Vancouver, British Colombia	6160			
0500-0600		CFCF, Montreal, Quebec	6005			
0500-0600		CFCN, Calgary, Alberta	6030			
0500-0600		CHNS, Halifax, Nova Scotia	6130			
0500-0600		Christian Science World Service	9455	9870	13760	
0500-0600		CKWX, Vancouver, British Colombia	6080			
0500-0600		CFRB, Toronto, Ontario	6070			
0500-0600		FEBC, Manila, Philippines	11850			
0500-0600		HCJB, Quito, Ecuador	6230	9745	11775	
0500-0600		Radio 5, South Africa	4880	11880		
0500-0600		Radio Australia, Melbourne	11910	15160	15240	15320
			17715	17795	21525	21740
0500-0600		Radio Havana Cuba	5965	11760		
0500-0600		Radio Japan, Tokyo	15195	15270	17765	17810
			17825			
0500-0600		Radio Kuwait	15345			
0500-0600		Radio Moscow, USSR	9765	11675	13710	15180
			15230	15280	15320	15425
			15445	15540	17570	17600
			17665	17860	17880	
0500-0600		Radio New Zealand, Wellington	15485	17705		
0500-0600		Radio for Peace, Costa Rica	7375t	13660	21565	
0500-0600		Radio Thailand, Bangkok	9655	11905		
0500-0600		Radio Tonga, Tonga	5050			
0500-0600	S,M	Radio Zambia, Lusaka	11880			
0500-0600		SBC Radio One, Singapore	5052	11940		
0500-0600		Spanish National Radio, Madrid	9630			
0500-0600	A,S	Superpower KUSW, Utah	6175			
0500-0600	S	Swaziland Commercial Radio	6155	9705		
0500-0600		Voice of America, Washington	6035	6040	7170	7200
			9540	9575	15205	
0500-0600		Voice of Kenya, Nairobi	6045			
0500-0600	IRR	Voice of Nicaragua, Managua	6100			
0500-0600		WINB, Red Lion, Pennsylvania	15145			
0500-0600		WHRI, Noblesville, Indiana	7365	9495		
0500-0600	M-A	WMLK, Bethel, Pennsylvania	9465			
0500-0600		WYFR Satellite Net, California	5985	11580	15566	17640
0510-0520		Radio Botswana, Gaborone	3356	4820	7255	
0515-0530	M-F	Radio Canada Int'l, Montreal	6055	6140	7155	9740
			9760	11840	15225	
0515-0600		Radio Berlin Int'l, East Germany	15240	17880	21540	
0527-0600	F	FEBA, Seychelles	17820			
0530-0545		BBC, London, England*	3990	6050	6140	7210
			9750			
0530-0555		Radio Austria Int'l, Vienna	6015			
0530-0555		Radio Bucharest, Romania	9640	11840	11940	15340
			15380	17720		
0530-0600		Radio Tirana, Albania	7300			
0530-0600		Trans World Radio, Swaziland	5055	7210		
0530-0600		UAE Radio, United Arab Emirates	15435	17775	21700	
0545-0600		Radio Berlin Int'l, East Germany	15240	17800	21645	
0545-0600	M-F	Radio Canada Int'l, Montreal	6055	6140	7155	9740
			9760	11840	15225	
0555-0600		Ghana Broadcasting Corp., Accra	4915			
0555-0600		Voice of Malaysia, Kuala Lumpur	6175	9750	15295	

0600 UTC [2:00 AM EDT/11:00 PM PDT]

0600-0615		Radio Ghana, Accra	3366	4915		
0600-0615	M-A	Radio Zambia, Lusaka	6165	7235		
0600-0620		Vatican Radio, Vatican City	6185	9645		
0600-0630	F	FEBA, Mahe, Seychelles	17820			
0600-0630		Laotian National Radio	7113			
0600-0630		Radio Australia, Melbourne	11910	15160	15240	15395
			17715	21525	21740	
0600-0630		Radio Berlin Int'l, East Germany	15240	17880	21645	
0600-0630		Trans World Radio, Swaziland	6070			
0600-0630		Voice of Kenya, Nairobi	6045			
0600-0645		Radio Berlin Int'l, East Germany	5965	11810		
0600-0645	S	Radio Cameroon, Yaounde	4850			
0600-0650		Deutsche Welle, West Germany	11765	13790	15185	17875
0600-0650		Radio Pyongyang, North Korea	13650	15160	15180	
0600-0700		BBC, London, England	5975	6005	6195	7150
			9410	9580	9600	9610
			9640	9760	11925	11940
			12095	15070	15280	17740
			17815	17885	21470	
0600-0700		CBC Northern Quebec Service	6195	9625		
0600-0700		CBU, Vancouver, British Colombia	6160			
0600-0700		CFCF, Montreal, Quebec	6005			
0600-0700		CFCN, Calgary, Alberta	6030			
0600-0700		CHNS, Halifax, Nova Scotia	6130			
0600-0700		Christian Science World Service	9455	9840	11980	
0600-0700		CKWX, Vancouver, British Colombia	6080			

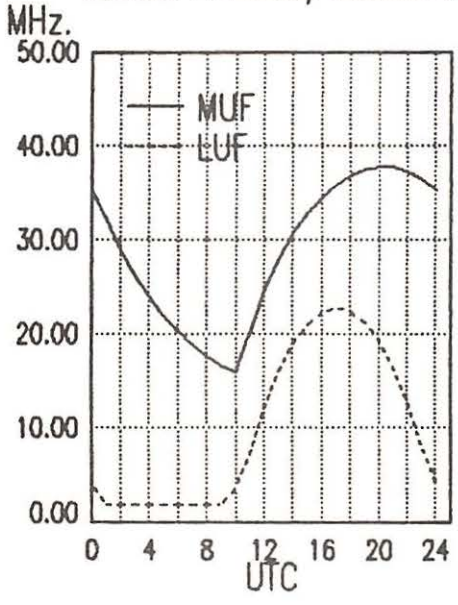


0600-0700		CFRB, Toronto, Ontario	6070			
0600-0700		HCJB, Quito, Ecuador	6230	9745	11775	
0600-0700		King of Hope, South Lebanon	6215			
0600-0700		Radio Havana Cuba	11835			
0600-0700		Radio Jordan, Amman	9560			
0600-0700		Radio Korea, Seoul, South Korea	7275	9570	11830	
0600-0700		Radio Kuwait	15345			
0600-0700		Radio Moscow, USSR	9765	13605	13710	15180
			15405	15425	15480	17635
			17665	17860	17880	21645
0600-0700		Radio New Zealand, Wellington	15485	17705		
0600-0700	A,S	Radio Thailand, Bangkok	9655	11905		
0600-0700		Radio Tonga, Tonga	5050			
0600-0700	IRR	Radio Zambia, Lusaka	11880			
0600-0700		Radio 5, South Africa	11880			
0600-0700		SBC Radio One, Singapore	5052	11940		
0600-0700	S	Superpower KUSW, Utah	6175			
0600-0700		Voice of America, Washington	6035	6080	6125	7170
			7200	7280	7325	9530
			9540	9575	11915	
0600-0700		Voice of Asia, Taiwan	7285			
0600-0700		Voice of Malaysia, Kuala Lumpur	6175	9750	15295	
0600-0700		Voice of Nicaragua, Managua	6100			
0600-0700		Voice of the Mediterranean	9765			
0600-0700		WHRI, Noblesville, Indiana	9495	9620		
0600-0700	M-A	WMLK, Bethel, Pennsylvania	9465			
0600-0700		WYFR, Oakland, California	13760	11580		
0600-0700		WYFR Satellite Net, California	5985	6065	7355	9852.5
			15566	17640		
0615-0630	M-A	Vatican Radio, Vatican City	15190	17730		
0625-0700		Trans World Radio Monte Carlo	7105			
0630-0635	M-F	RTVC, Brazzaville, Congo	15190	irr		
0630-0700		AWR, Forli, Italy	7125			
0630-0700		Radio Australia, Melbourne	11910	15160	15240	15395
			17715	17750	21740	
0630-0700		Radio Bucharest, Romania	21600			
0630-0700		Radio Finland, Helsinki	6120	9560	11755	15270
0630-0700		Radio Polonia, Warsaw, Poland	6135	7270	15120	
0630-0700		Swiss Radio Int'l, Berne	3985	6165	9535	12030
			15430	17570		
0630-0700		Trans World Radio, Swaziland	5055	6070	7210	9725
0630-0700	A,S	Voice of Kenya, Nairobi	7270			
0645-0700		BBC, London, England*	6150	7260	11945	
0645-0700		Radio Ghana, Accra	6130			
0645-0700		Radio Bucharest, Romania	11940	15250	15335	17790
			17805	21665		

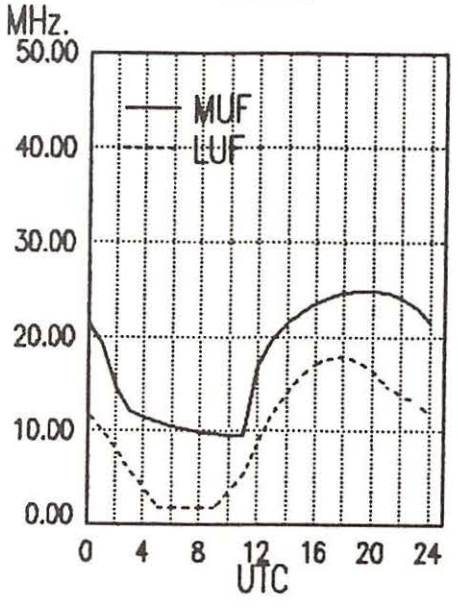
0700 UTC [3:00 AM EDT/12:00 PM PDT]

0700-0710		Radio Bucharest, Romania	11940	15250	15335	17790
			17805	21665		
0700-0710		Radio Sierra Leone, Freetown	5980			
0700-0715		Radio Ghana (HS), Accra	3366	4915		
0700-0730		BBC, London, England	3955	5975	7150	9410
			9600	9640	9760	11940
			12095	15070	15280	15400
			17815	21470		
0700-0730		Burma Bcasting Service, Rangoon	9730			
0700-0730		Radio Australia, Melbourne	9655	11720	11910	15160
			15240	15395	15425	17715
			21740			
0700-0730		Radio Bucharest, Romania	21600			
0700-0730		Radio New Zealand, Wellington	15485	17705		
0700-0730	S	Radio Zambia, Lusaka	11880			
0700-0750		Radio Pyongyang, North Korea	15340	17795		
0700-0800		ABC, Perth, Australia	15425			
0700-0800		CBU, Vancouver, British Colombia	6160			
0700-0800		CFCF, Montreal, Quebec	6005			
0700-0800		CFCN, Calgary, Alberta	6030			
0700-0800		CHNS, Halifax, Nova Scotia	6130			
0700-0800		Christian Science World Service	9455	9840	11980	
0700-0800		CKWX, Vancouver, British Columbia	6080			
0700-0800		CFRB, Toronto, Ontario	6070			
0700-0800		ELWA, Monrovia, Liberia	11830			
0700-0800		HCJB, Quito, Ecuador	6130	9610	9745	11835
			11925			
0700-0800		King of Hope, South Lebanon	6215			
0700-0800		Radio Ghana, Accra	6130			
0700-0800		Radio Havana Cuba	11835			
0700-0800		Radio Japan, Tokyo	5990	15195	15270	15325
			17765	17810	21500	21690
0700-0800		Radio Jordan, Amman	11955			
0700-0800		Radio Korea, Seoul, South Korea	6060	7275	9570	
0700-0800		Radio Kuwait	15345			
0700-0800		Radio Moscow, USSR	9765	11845	13710	15135
			15480	15540	17660	21690
0700-0800	A,S	Radio Thailand, Bangkok	9655	11905		
0700-0800		Radio Tonga, Tonga	5050			

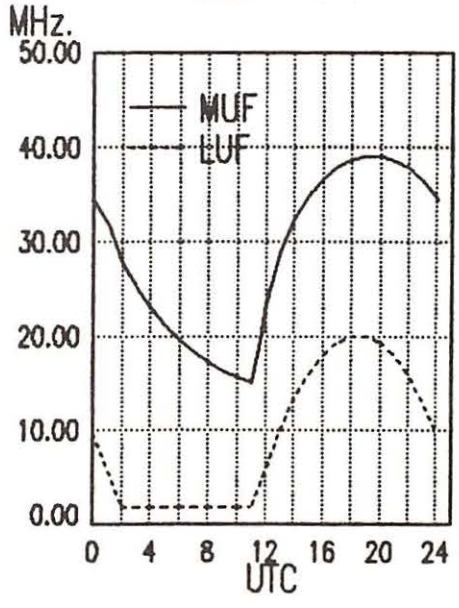
East Coast To
Central America/Caribbean



East Coast To
Alaska



East Coast To
West Coast



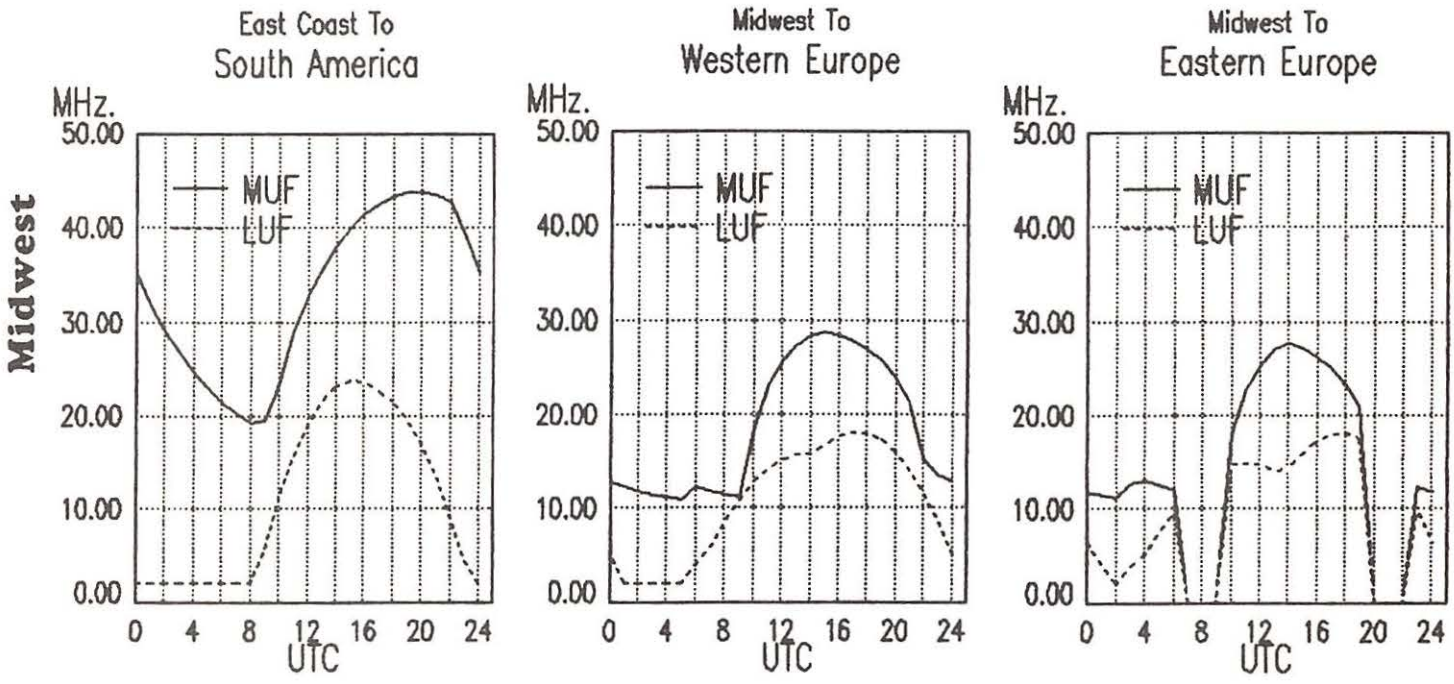
East Coast

frequency section

0700-0800		Radio 5, South Africa	11880				
0700-0800		SBC-1, Singapore	5052	11940			
0700-0800		Soloman Islands Broadcasting Corp	9545				
0700-0800	S	Superpower KUSW, Utah	6135				
0700-0800		Trans World Radio, Monte Carlo	9485				
0700-0800		Trans World Radio, Swaziland	6070	9725			
0700-0800		Voice of America, Washington	6020				
0700-0800		Voice of Free China, Taiwan	5950				
0700-0800	A,S	Voice of Kenya, Nairobi	7270				
0700-0800		Voice of Malaysia, Kuala Lumpur	6175	9750	15295		
0700-0800		WHRI, Noblesville, Indiana	9495	9620			
0700-0800	M-A	WMLK, Bethel, Pennsylvania	9455				
0700-0800		WYFR, Oakland, California	6065	7355	9852.5	15566	
0700-0800		WYFR Satellite Network	13760				
0715-0730		Radio Korea, Seoul, South Korea	13670	15575			
0715-0730	M-A	Vatican Radio, Vatican City	11725	15190			
0715-0735	S	FEBA, Mahe, Seychelles	15115	17785			
0715-0800		Radio Berlin Int'l, East Germany	6040	7185	9730	21465	
			21540				
0720-0730	M-A	Vatican Radio, Vatican City	6248	9645	11740		
0730-0735		All India Radio, New Delhi	5990	6010	6020	7110	
			7205	9610	9675	11850	
			11935	15235	15250	17705	
0730-0800		ABC, Alice Springs, Australia	2310	[ML]			
0730-0800		ABC, Katherine, Australia	2485				
0730-0800		ABC, Tennant Creek, Australia	2325	[ML]			
0730-0800		Radio Australia, Melbourne	9655	15160	15395	17715	
0730-0745		BBC, London, England*	3975	6010	7230	9915	
0730-0755		Radio Austria Int'l, Vienna	6155	13730	15410	21490	
0730-0755		Radio Finland, Helsinki	6120	9560	11755		
0730-0800		AWR, Forli, Italy	7125				
0730-0800		BBC, London, England	3955	7150	7325	9410	
			9600	9640	9760	11860	
			11940	12095	15070	15280	
			15400	17815	21470		
0730-0800		Radio Netherland, Hilversum	9630	9715			
0730-0800		Radio Prague, Czechoslovakia	11685	17840	21705		
0730-0800		Swiss Radio Int'l, Berne	3985	6165	9535		
0740-0750	W	Radio Free Europe, Munich*	5985	7115	9695	9725	
			11895	15355			
0745-0800		Radio Berlin Int'l, East Germany	6040	6115	7185	9730	
			21465	21540			
0755-0800		Radio Pacific Okean, USSR	12050	12070	17605		

0800 UTC [4:00 AM EDT/1:00 AM PDT]

0800-0805	M-F	Port Moresby, Papua New Guinea	3925	4890	5960	5985	
			6020	6040	6080	6140	
			9520				
0800-0805		Soloman Islands Broadcasting Corp	9545				
0800-0815	M-A	Radio Zambia, Lusaka	6165	7235			
0800-0825	M-A	Radio Finland, Helsinki	17795	21550			
0800-0825		Radio Netherland, Hilversum	9630	9715			
0800-0825		Voice of Malaysia, Kuala Lumpur	6175	9750	15295		
0800-0830		HCJB, Quito, Ecuador	6130	9610	9745	11835	
			11925				
0800-0830	S	Radio Austria Int'l, Vienna	6155	13730	15410	15450	
0800-0830		Radio Bangladesh, Dhaka	12030	15525			
0800-0830		Radio Berlin Int'l, East Germany	6040	6115	7185	9730	
			21465	21540			
0800-0830	S	Radio Norway, Oslo	15165	21730			
0800-0830		Radio Tirana, Albania	9500	11835			
0800-0830		Voice of Islam, Pakistan	15525	17870			
0800-0835	S	FEBA, Mahe, Seychelles	15325,	17785			
0800-0835		Trans World Radio, Swaziland	6070	9725			
0800-0840		Trans World Radio, Monte Carlo	9485				
0800-0850		Deutsche Welle, West Germany	9770				
0800-0850		Radio Pyongyang, North Korea	11830	15115	15160	15180	
0800-0900		ABC, Alice Springs, Australia	2310	[ML]			
0800-0900		ABC, Katherine, Australia	2485				
0800-0900		ABC, Perth, Australia	15425				
0800-0900		ABC, Tennant Creek, Australia	2325	[ML]			
0800-0900		AFAN, Antarctica	6010.5				
0800-0900		BBC, London, England	7150	9600	9640	9760	
			11860	11940	12095	15280	
			15360	15070	15400	17815	
			15240				
0800-0900		CBN, St. John's, Newfoundland	6160				
0800-0900		CBU, Vancouver, British Colombia	6160				
0800-0900		CFCF, Montreal, Quebec	6005				
0800-0900		CFCN, Calgary, Alberta	6030				
0800-0900		CHNS, Halifax, Nova Scotia	6130				
0800-0900		Christian Science World Service	9455	17855			
0800-0900		CKWX, Vancouver, British Colombia	6080				
0800-0900		CFRB, Toronto, Ontario	6070				
0800-0900		King of Hope, South Lebanon	6215				
0800-0900		KNLS, Anchor Point, Alaska	11715				

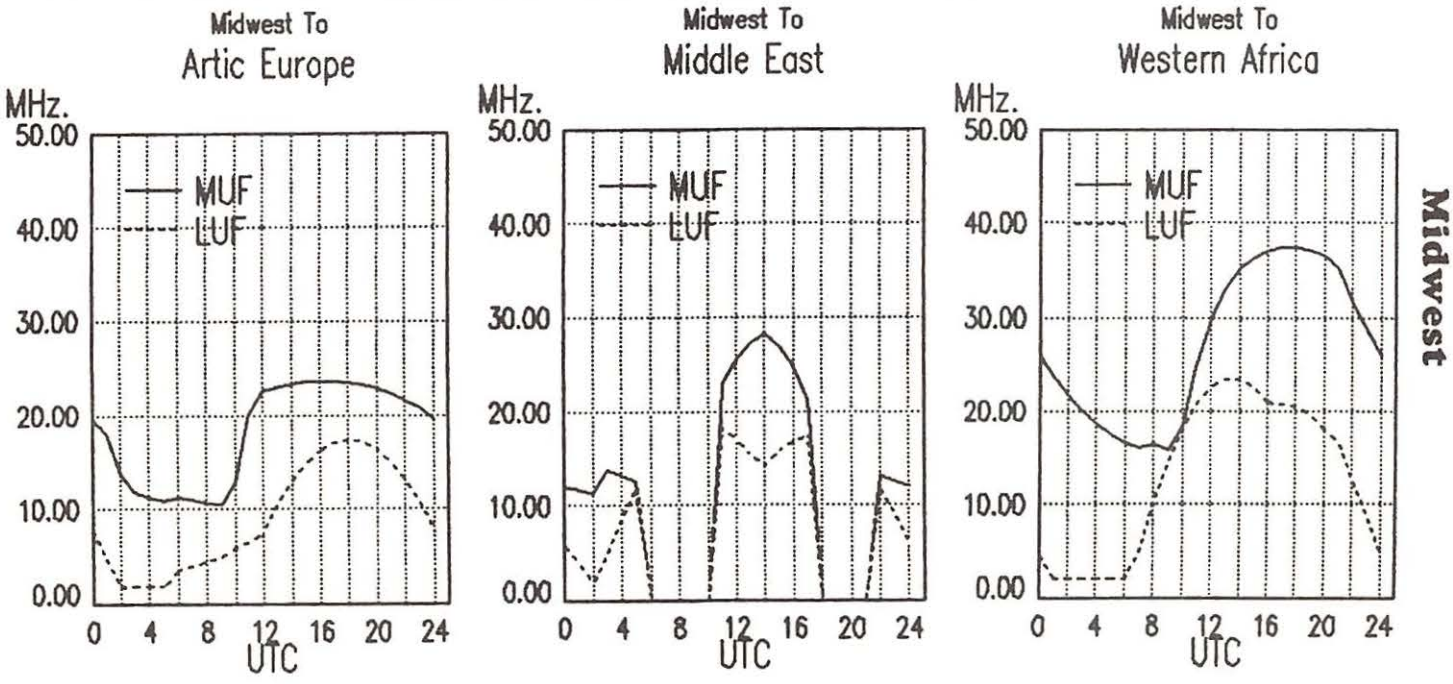


frequency section

0800-0900		Radio Australia, Melbourne	5995	6020	9580	9655
			9710	11720	11750	11770
			15395	17715		
0800-0900		Radio Jordan, Amman	11955			
0800-0900		Radio Moscow, USSR	15135	15535	15585	17570
			17660	21690		
0800-0900		Radio for Peace, Costa Rica	12030			
0800-0900		Radio Tongo, Tongo	5050			
0800-0900		SBC Radio One, Singapore	5052	11940		
0800-0900	S	Superpower KUSW, Utah	6135			
0800-0900		Voice of Indonesia, Jakarta	11790	15105		
0800-0900	A,S	Voice of Kenya, Nairobi	7270			
0800-0900		WHRI, Noblesville, Indiana	7355			
0805-0900		KTWR, Guam	15210			
0815-0845	M-F	Voice of America, Washington DC	7175	9575	9750	11710
			11915	15600	17715	21500
			[ML]			
0830-0840		All India Radio, New Delhi	5960	5990	6010	6020
			6050	6065	6100	6140
			7110	7140	7160	7250
			7280	7295	9610	11850
			15235	15250	17705	
0830-0900	S	Bhutan Bcasting Service, Thimpu	6035			
0830-0900		FEBC, Manila, Philippines	11850	15350		
0830-0900		HCJB, Quito, Ecuador	6130	9745	11925	
0830-0900		Radio Beijing, China	9700	11755	15440	
0830-0855		Radio Finland, Helsinki	15245	17795		
0830-0900		Radio Netherlands, Hilversum	9770	17575	21485	
0830-0900		Radio Prague, Czechoslovakia	11685	17840	21705	
0830-0900		Swiss Radio Int'l, Berne	9560	9885	13685	17830
			21695			
0840-0850	M-A	Voice of Greece, Athens	9855	15630		
0840-0900	S-F	Trans World Radio, Monte Carlo	7105			
0845-0900		Radio Prague, Czechoslovakia	6055	7345	9505	
0850-0900		All India Radio, New Delhi	5960	5990	6010	6020
			6050	6065	6100	6140
			7110	7140	7150	7160
			7250	7280	7295	9610
			11850	15235	15250	17705
0850-0900		Radio Korea, Seoul	13670			

0900 UTC [5:00 AM EDT/2:00 AM PDT]

0900-0910		All India Radio, New Delhi	5960	5990	6010	6020
			6050	6065	6100	6140
			7110	7140	7150	7160
			7250	7280	7295	9610
			11850	15235	15250	17705
0900-0910	S	Trans World Radio, Monte Carlo	7105			
0900-0910		Voice of Lebanon, Beirut	6548			
0900-0920		ABC, Perth, Australia	15425			
0900-0920		KTWR, Agana, Guam	15210			
0900-0925		BRT, Brussels, Belgium	5915	17595	21810	26050
0900-0925		Radio Netherlands, Hilversum	17575	21485		
0900-0930		FEBC, Manila, Philippines	11850	15350		
0900-0930		Nippon Broadcasting Corp.	3925			
0900-0930		Radio Beijing, China	11755	15440		
0900-0930		Radio Norway, Oslo	17840			
0900-0930	A,S	Radio Prague, Czechoslovakia	11685	17840	21705	
0900-0945		Radio Berlin Int'l, East Germany	9770	11890	21540	
0900-0950		Deutsche Welle, West Germany	6160	9650	11785	11945
			17780	21650		
0900-1000		ABC, Alice Springs, Australia	2310	[ML]		
0900-1000		ABC, Katherine, Australia	2485			
0900-1000		ABC, Tennant Creek, Australia	2325	[ML]		
0900-1000	S	Adventist World Radio, Portugal	9670			
0900-1000		BBC, London, England	9410	9740	9750	11750
			11845	11860	11940	11955
			12095	15070	15175	15280
			15360	15400	17705	17640
			17790	17815	21470	
0900-1000		CFCF, Montreal, Quebec	6005			
0900-1000		CFCN, Calgary, Alberta	6030			
0900-1000		CHNS, Halifax, Nova Scotia	6130			
0900-1000		Christian Science World Service	9455	17855		
0900-1000		CKWX, Vancouver, British Colombia	6080			
0900-1000		CFRB, Toronto, Ontario	6070			
0900-1000		HCJB, Quito, Ecuador	6130	9745	11925	
0900-1000		King of Hope, South Lebanon	6215			
0900-1000		KNLS, Anchor Point, Alaska	6065			
0900-1000		Radio Afghanistan, Kabul	4450	6085	15435	17720
0900-1000		Radio Australia, Melbourne	5995	6080	9580	9655
			9710	9760	11720	11770
			15415			
0900-1000		Radio Japan, Tokyo	11840	11885	15270	17810

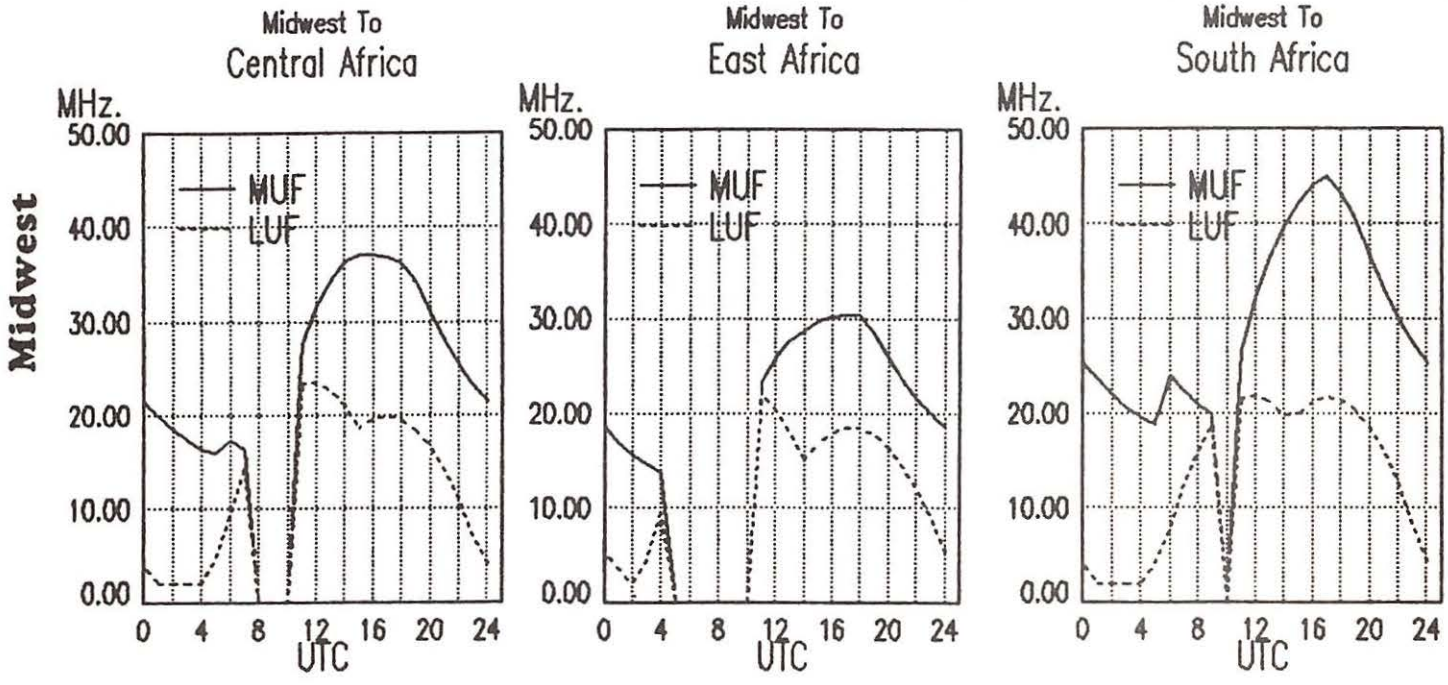


frequency section

0900-1000		Radio Japan, Tokyo	11840	11885	15270	17810	
			17890				
0900-1000		Radio Korea, Seoul, South Korea	7550	13670			
0900-1000		Radio Moscow, USSR	15135	15535	15540	15580	
			17570	17660	21585		
0900-1000		Radio New Zealand, Wellington	9850				
0900-1000		Radio for Peace, Costa Rica	13660				
0900-1000	S	Radio Prague, Czechoslovakia	6055	7345	9505	[ML]	
0900-1000		Radio RSA, South Africa	11805				
0900-1000		Radio Tanzania, Dar es Salaam	7165				
0900-1000		Radio Tonga, Tonga	5050				
0900-1000		SBC Radio One, Singapore	5010	5052	11940		
0900-1000	S	Superpower KUSW, Utah	6135				
0900-1000		Voice of America, Washington	5985	6030	6130	9560	
			11720				
0900-1000		Voice of Kenya, Nairobi	7270				
0900-1000		WHRI, Noblesville, Indiana	7355	9495			
0900-1000		WYFR, Oakland, California	5950	11580			
0915-0930		Radio Korea, Seoul, South Korea	9570				
0915-0950	M-A	Radio Ulan Bator, Mongolia	9615	12015			
0920-1000		ABC, Perth, Australia	6140				
0925-1000		KTWR, Guam	11805				
0930-0935		All India Radio, New Delhi	5960	5990	6010	6020	
			6050	6065	6100	6140	
			7110	7140	7160	7250	
			7280	7295	9610	11850	
			15235	15250	17705		
0930-0945		BBC, London, England*	9725	11955			
0930-1000		CBN, St. John's, Newfoundland	6160				
0930-1000		Radio Beijing, China	9700	11755	15440		
0930-1000		Radio Sweden Int'l, Stockholm	15390				
0945-1000		BBC, London, England*	5995	7180	9725	11955	
0945-1000		Radio Berlin Int'l, East Germany	6115				
0945-1000	M-A	Radio Prague, Czechoslovakia	6055	7345	9505		

1000 UTC [6:00 AM EDT/3:00 AM PDT]

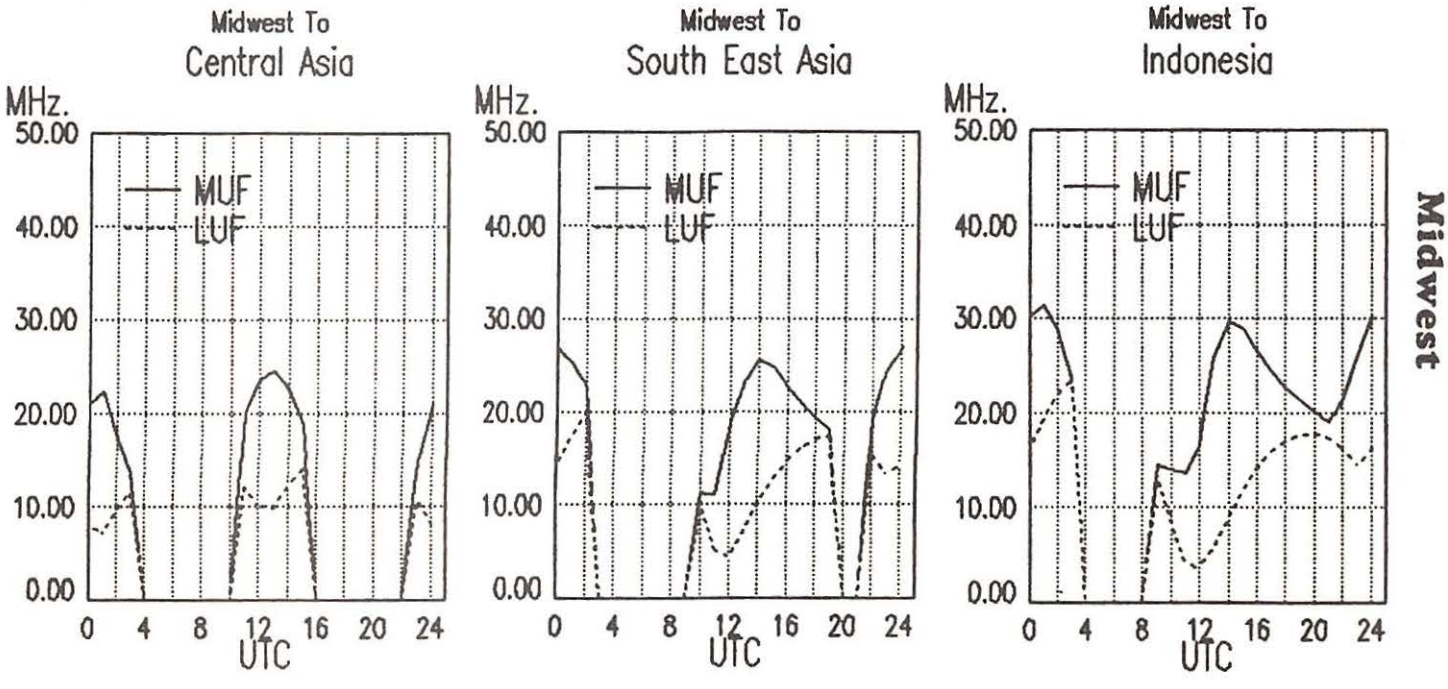
1000-1030		HCJB, Quito, Ecuador	6130	9745	11925		
1000-1030		Kol Israel, Jerusalem	15650	17575	21760		
1000-1030		Radio Afghanistan, Kabul	4450	6085	15435	17720	
1000-1030		Radio Beijing, China	11755	15440	17710		
1000-1030		Radio Berlin Int'l, East Germany	6115				
1000-1030		Radio Tanzania, Dar es Salaam	7165				
1000-1030		Swiss Radio Int'l, Berne	9560	13685	17670	21695	
1000-1030		Voice of Ethiopia, Addis Ababa	9560				
1000-1030		Voice of Vietnam, Hanoi	9840	15010			
1000-1055	A	Trans World Radio, Monte Carlo	7105				
1000-1100		ABC, Alice Springs, Australia	2310	[ML]			
1000-1100		ABC, Katherine, Australia	2485				
1000-1100		ABC, Perth, Australia	9610				
1000-1100		ABC, Tennant Creek, Australia	2325	[ML]			
1000-1100		All India Radio, New Delhi	11860	11915	15130	15335	
			17387	11785			
1000-1100		BBC, London, England	9410	9740	11750	11940	
			12095	15070	15360	17640	
			17705	17790	17830	21710	
			25750				
1000-1100		CBN, St. John's, Newfoundland	6160				
1000-1100		CFCF, Montreal, Quebec	6005				
1000-1100		CFCN, Calgary, Alberta	6030				
1000-1100		CHNS, Halifax, Nova Scotia	6130				
1000-1100		Christian Science World Service	9455	9495			
1000-1100		CKWX, Vancouver, British Colombia	6080				
1000-1100		CFRB, Toronto, Ontario	6070				
1000-1100		FEBC, Manila, Philippines	11850				
1000-1100		KSDA, Guam	13720				
1000-1100		KTWR, Agana, Guam	11805				
1000-1100		Radio Afghanistan, Kabul	15435	17720			
1000-1100		Radio Australia, Melbourne	5955	5995	6020	7205	
			9580	9655	9710	9655	
			9770	15415			
1000-1100		Radio Moscow, USSR	9600	15110	15130	15405	
			15420	15520	15535	15550	
			15585	15590	17660	17815	
			17830	21690	21800	25780	
1000-1100		Radio New Zealand, Wellington	6100	9850			
1000-1100	S	Radio Prague, Czechoslovakia	6055	7345	9505	[ML]	
1000-1100		Radio RSA, South Africa	11805				
1000-1100		SBC Radio One, Singapore	5010	5052	11940		
1000-1100	S	Superpower KUSW, Utah	6135				
1000-1100		Voice of America, Washington	6030	5985	6165	9530	
			9590	11720	15425		
1000-1100		Voice of Kenya, Nairobi	7270				
1000-1100		WHRI, Noblesville, Indiana	7355				
1000-1100		WYFR, Oakland, California	5950	17530			
1005-1010		Radio Pakistan, Islamabad	15606	17660			
1030-1040		Voice of Asia, Taiwan	5980				
1030-1045	A	Radio Budapest, Hungary	7220	9585	9835	11910	
			15160	15220			



1030-1055		Radio Austria Int'l, Vienna	15450	21490			
1030-1100		BBC, London, England*	7180	9660	9725		
1030-1100		HCJB, Quito, Ecuador	6130	9745	11925		
1030-1100		Radio Netherlands, Hilversum	6020	9675			
1030-1100	A,S	Radio Tanzania, Dar es Salaam	7165				
1030-1100		SLBC, Colombo, Sri Lanka	11835	15120	17850	[ML]	
1030-1100		UAE Radio, United Arab Emirates	15320	15435	17775	21605	
1030-1100		Voice of America, Washington*	11965				
1040-1050	H	Radio Free Europe, Munich*	7115	9695	9725		
			11895	15355			
1040-1050	M-A	Voice of Greece, Athens	11645	15630			
1045-1100	S	Radio Budapest, Hungary	7220	9585	9835	11910	
			15160	15220			
1045-1100	M-A	Radio Prague, Czechoslovakia	6055	7345	9505		
1055-1100		Trans World Radio, Bonaire	11815	15345			
1055-1100	S	Trans World Radio, Monte Carlo	7105				

1100 UTC [7:00 AM EDT/4:00 AM PDT]

1100-1105		Radio Pakistan, Islamabad	6090	7290			
1100-1115		Radio New Zealand, Wellington	6100	9850			
1100-1120		Radio Pakistan, Islamabad	15606	17760			
1100-1125		Radio Netherland, Hilversum	6020	9675			
1100-1130		BBC, London, England*	7120				
1100-1130		HCJB, Quito, Ecuador	6130	9745	11925		
1100-1130		KTWR, Guam*	9820	11665			
1100-1130		Radio Finland, Helsinki	15400	21550			
1100-1130		Radio Mozambique, Maputo	9525	11818	11835		
1100-1130		SLBC, Colombo, Sri Lanka	11835	15120	17850	[ML]	
1100-1130		Swiss Radio Int'l, Berne	13635	15570	17830	21550	
1100-1130		Voice of Vietnam, Hanoi	12010	15010			
1100-1145		Radio Berlin Int'l, East Germany	6115	9665	17775		
1100-1150		Deutsche Welle, West Germany	15410	17765	17800	21600	
1100-1150		Radio Pyongyang, North Korea	9600	9977	11735		
1100-1155		Radio Beijing, China	9660	15540	17855		
1100-1200		ABC, Alice Springs, Australia	2310	[ML]			
1100-1200		ABC, Katherine, Australia	2485				
1100-1200		ABC, Perth, Australia	9610				
1100-1200		ABC, Tennant Creek, Australia	2325	[ML]			
1100-1200		BBC, London, England	5965	6195	7180	9410	
			9515	9740	9750	9760	
			11750	11775	15070	15360	
			15420	17640	17780	17790	
			21470	25750			
1100-1200		CBC Northern Quebec Service	6065	9625			
1100-1200		CBN, St. John's, Newfoundland	6160				
1100-1200		CFCF, Montreal, Quebec	6005				
1100-1200		CFCN, Calgary, Alberta	6030				
1100-1200		CHNS, Halifax, Nova Scotia	6130				
1100-1200		Christian Science World Service	9455	9495			
1100-1200		CKWX, Vancouver, British Colombia	6080				
1100-1200		CFRB, Toronto, Ontario	6070				
1100-1200		KYOI, Saipan	9530				
1100-1200		Radio Australia, Melbourne	5995	6020	6060	6080	
			7205	7215	9580	9645	
			9710	9770			
1100-1200		Radio Japan, Tokyo	6120	11815	11840		
1100-1200		Radio Moscow, USSR	9600	15135	15220	15520	
			15585	17645	17660	17815	
			17890	21690	21800		
1100-1200		Radio RSA, South Africa	11805	11900	21590		
1100-1200	A,S	Radio Tanzania, Dar es Salaam	7165				
1100-1200	S	Radio Zambia, Lusaka	11880	[IRR]			
1100-1200		SBC-1, Singapore	5010	5052	11940		
1100-1200	S	Superpower KUSW, Utah	9850				
1100-1200		Trans World Radio, Bonaire	11815	15345			
1100-1200		Voice of America, Washington	5985	6110	6165	9590	
			9660	9760	11720	11745	
			11915	15425			
1100-1200		Voice of Asia, Taiwan	5980	7445			
1100-1200		Voice of Kenya, Nairobi	7270				
1100-1200		WHRI, Noblesville, Indiana	9465	11790			
1100-1200		WRNO, New Orleans, Louisiana	6185				
1100-1200		WYFR, Oakland, California	5950	11580	17530	17640	
1110-1120	M-F	Radio Botswana, Gaborone	4820	5955	7255		
1115-1130		Radio Korea, Seoul, South Korea	11740				
1115-1130		Vatican Radio, Vatican City	17840	21485			
1115-1145		Radio Nepal, Kathmandu	5005				
1130-1145	A	Radio Budapest, Hungary	7220	9585	9835	11910	
			15160	15220			
1130-1155		Radio Austria Int'l, Vienna	6155	13730	15450	17870	
1130-1200		HCJB, Quito, Ecuador	11740				
1130-1200		Radio Berlin Int'l, East Germany	15440	17880	21465	21540	
1130-1200		Radio Netherland, Hilversum	5955	9715	17575	21480	
			21520				
1130-1200		Radio Thailand, Bangkok	9655	11905			
1130-1200		Radio Tirana, Albania	9480	11855			
1130-1200		Voice of Islamic Republic Iran	7230	9520	9685	11790	

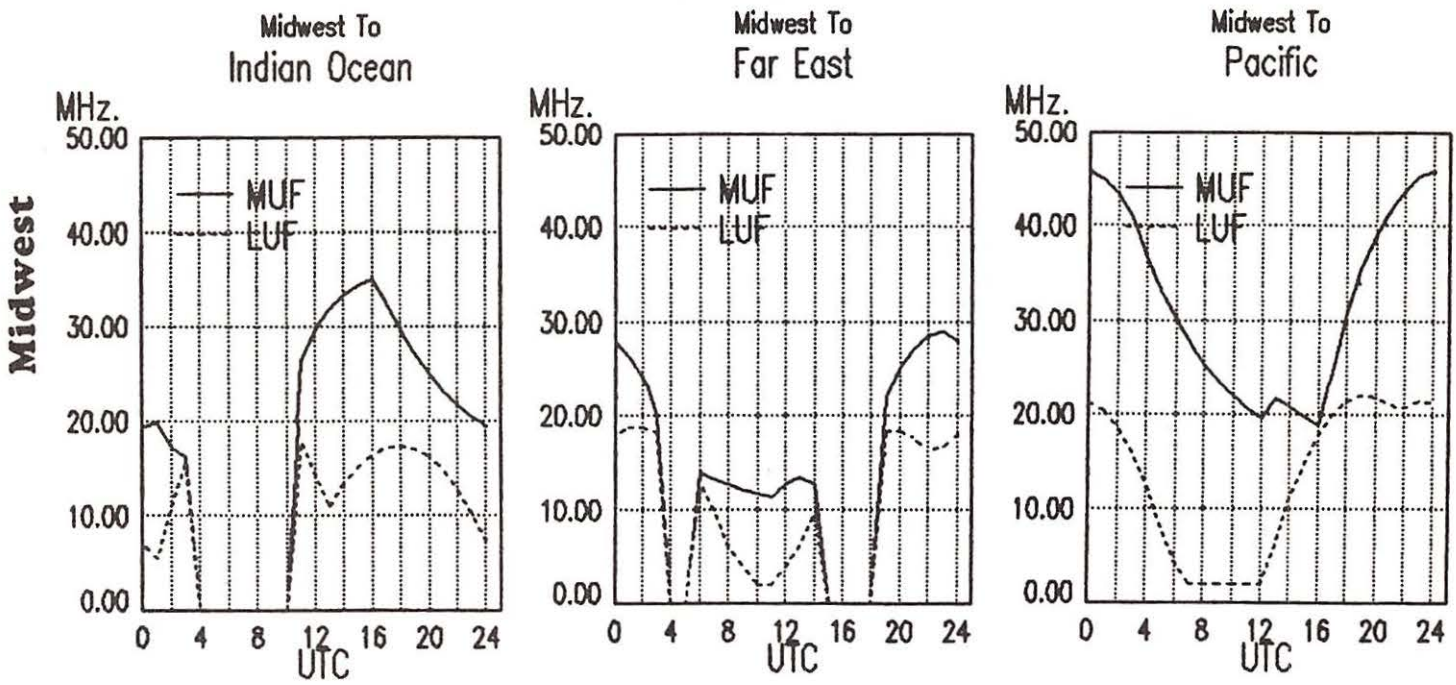


frequency section

1135-1140		All India Radio, New Delhi	6065	7110	9610	9675
			11850	15320		
1140-1145	M-A	Vatican Radio, Vatican City	6248	9645	11740	
1145-1200		BBC, London, England*	7180	15280		
1145-1200		Radio Bangladesh, Dakha	15255	17740		
1145-1200		Radio Prague, Czechoslovakia	6055	7345	9505	

1200 UTC [8:00 AM EDT/5:00 AM PDT]

1200-1215		BBC, London, England*	3915	6065	7275	
1200-1215		Radio Berlin Int'l, East Germany	15440	17880	21465	21540
1200-1215		Vatican Radio, Vatican City	17865	21515		
1200-1215		Voice of Kampuchea, Phnom-Penh	9693	11938		
1200-1220		Radio Bucharest, Romania	17720	21665		
1200-1225	M-F	Radio Finland, Helsinki	15400	21550		
1200-1225		Radio Polonia, Warsaw, Poland	6095	7285		
1200-1230		Radio Netherland, Hilversum	5955	9715	17575	21480
			21520			
1200-1230	S	Radio Norway, Oslo	15325			
1200-1230		Radio Somalia, Mogadishu	6095			
1200-1230		Radio Tashkent, Uzbek, USSR	9540	9600	11785	15460
1200-1230		Radio Thailand, Bangkok	9655	11905		
1200-1230		Radio Yugoslavia, Belgrade	17740	21555	25795	
1200-1230	S	Radio Zambia, Lusaka	11880	[IRR]		
1200-1230		Swiss Radio Int'l, Berne	6165	9535	12030	
1200-1235	M-A	Radio Ulan Bator, Mongolia	9615	12015		
1200-1255		Radio Beijing, China	11600	11660	15400	15540
			17855			
1200-1300		ABC, Alice Springs, Australia	2310	[ML]		
1200-1300		ABC, Katherine, Australia	2485			
1200-1300		ABC, Perth, Australia	9660			
1200-1300		ABC, Tennant Creek, Australia	2325	[ML]		
1200-1300	S	Adventist World Radio, Africa	17890			
1200-1300		AFAN, Antarctica	6012			
1200-1300		BBC, London, England	6195	9510	9740	11750
			11775	11940	12095	15070
			17640	17705	17790	21470
			21710	25750		
1200-1300		CBC Northern Quebec Service	6065	9625		
1200-1300		CBN, St. John's, Newfoundland	6160			
1200-1300		CFCF, Montreal, Quebec	6005			
1200-1300		CFCN, Calgary, Alberta	6030			
1200-1300		CHNS, Halifax, Nova Scotia	6130			
1200-1300		Christian Science World Service	9495	11930		
1200-1300		CKWX, Vancouver, British Colombia	6080			
1200-1300		CFRB, Toronto, Ontario	6070			
1200-1300		HCJB, Quito, Ecuador	11740	15115	17890	
1200-1300		Radio Australia, Melbourne	5995	6020	6060	6080
			7205	7215	9580	9710
			9770	11800		
1200-1300		Radio Canada Int'l, Montreal	9635	11855	17820	
1200-1300		Radio Moscow, USSR	7370	9875	11685	12025
			15110	15130	15490	15520
			15550	15585	15595	17570
			17645	17660	17665	17815
			17830	21630	21725	
1200-1300		Radio RSA, South Africa	9585	11805	21590	
1200-1300	A,S	Radio Tanzania, Dar es Salaam	7165			
1200-1300		SBC Radio One, Singapore	5010	5052	11940	
1200-1300	A,S	Superpower KUSW, Utah	9850			
1200-1300		Trans World Radio, Bonaire	11815	15345		
1200-1300		Trans World Radio, Sri Lanka	11920			
1200-1300		Voice of America, Washington	6110	9760	11715	15155
			15160	15425		
1200-1300		Voice of Kenya, Nairobi	7270			
1200-1300		WHRI, Noblesville, Indiana	9465	11790		
1200-1300		WYFR, Oakland, California	5950	6015	11580	11830
			13695	15215	15255	
1215-1245		Radio Korea, Seoul, South Korea	7275	11740		
1215-1300		Radio Berlin Int'l, East Germany	11705	15240		
1215-1300		Radio Cairo, Egypt	17595			
1230-1235		All India Radio, New Delhi	3905	4800	4920	7280
			9565	9615	11620	11735
			15120	15250	17620	
1230-1255	M-A	BRT, Brussels, Belgium	17555	21815		
1230-1255		Voice of Turkey, Ankara	15255			
1230-1300		BBC, London, England*	6125	7255	6195	9635
			9660	11780	12040	15270
			15390	15435	17695	
1230-1300		Radio Bangladesh, Dhaka	15195	17710		
1230-1300		Radio Sweden, Stockholm	17740	21610		
1240-1250	M	Radio Free Europe, Munich*	5985	7115	9695	9725
			11895	15355		
1245-1300		Radio Berlin Int'l, East Germany	15440	17880	21465	21540
1245-1300		Radio France Int'l, Paris	9805	11670	15155	15195
			15365	17720	21635	21645
1235-1245		Voice of Greece, Athens	11645	15630	17550	

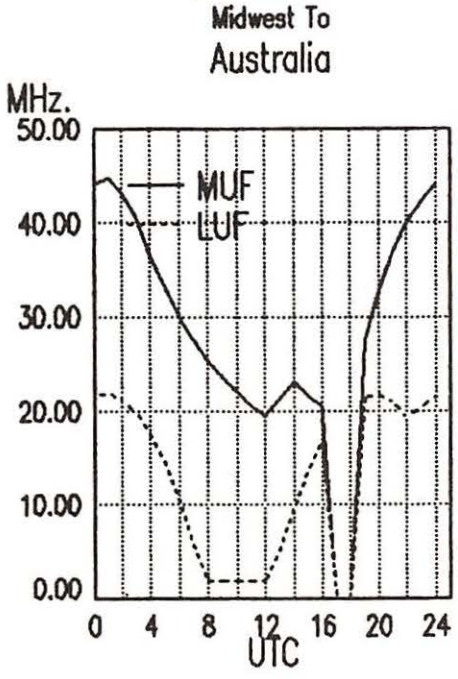


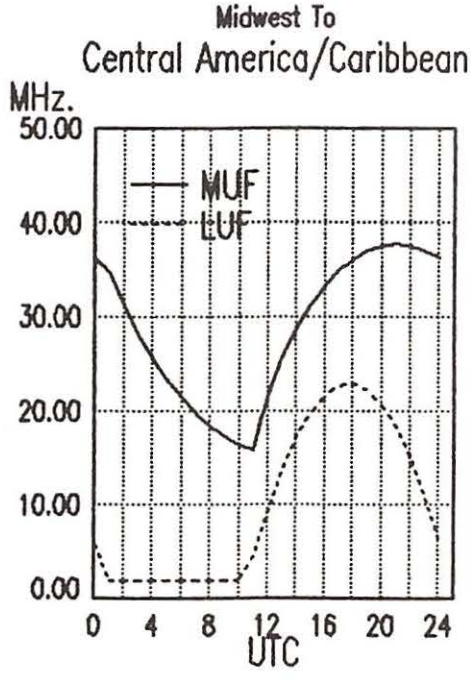
1300 UTC [9:00 AM EDT/6:00 AM PDT]

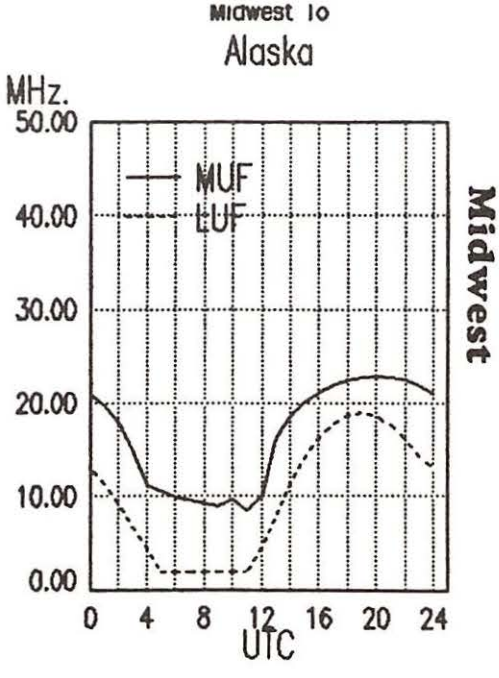
1300-1310		Radio France Int'l, Paris	11670	15155	15365	17720
			21635	21645		
1300-1325		Radio Bucharest, Romania	9690	11940	15405	17720
1300-1330		BBC, London, England	5995	6195	7180	9515
			9740	11750	11775	11940
			12095	15070	15310	15420
			17640	17790	21470	21710
1300-1330		Radio Berlin Int'l, East Germany	15440	17880	21465	21540
1300-1330		Radio Cairo, Egypt	17595			
1300-1330		Radio Finland, Helsinki	15400	21550		
1300-1330		Radio Ghana, Accra	4915	7295		
1300-1330	S	Radio Norway Int'l, Oslo	9590			
1300-1330		Trans World Radio, Sri Lanka	11920			
1300-1330		Voice of Kenya, Nairobi	7270			
1300-1332	A,S	Trans World Radio, Bonaire	11815	15345		
1300-1350		Radio Pyongyang, North Korea	9325	9345	9555	9600
			11335	11735		
1300-1355		Radio Beijing, China	11600	11660	11855	15280
			15455			
1300-1400		ABC, Alice Springs, Australia	2310	[ML]		
1300-1400		ABC, Katherine, Australia	2485			
1300-1400		ABC, Perth, Australia	9610			
1300-1400		ABC, Tennant Creek, Australia	2325	[ML]		
1300-1400		CBC Northern Quebec Service	9625	11720		
1300-1400		CBN, St. John's, Newfoundland	6160			
1300-1400		CBU, Vancouver, British Colombia	6160			
1300-1400		CFCF, Montreal, Quebec	6005			
1300-1400		CFCN, Calgary, Alberta	6030			
1300-1400		CHNS, Halifax, Nova Scotia	6130			
1300-1400		Christian Science World Service	9495	9530	11930	
1300-1400		CKWX, Vancouver, British Colombia	6080			
1300-1400		CFRB, Toronto, Ontario	6070			
1300-1400	S	ELWA, Monrovia, Liberia	11830			
1300-1400		FEBC, Manila, Philippines	11850			
1300-1400		HCJB, Quito, Ecuador	11740	15115	17890	
1300-1400		KNLS, Anchor Point, Alaska	7355			
1300-1400		Radio Australia, Melbourne	5995	6060	6080	7205
			9580			
1300-1400	S	Radio Canada Int'l, Montreal	9625	11720	11955	17820
1300-1400		Radio Jordan, Amman	9560			
1300-1400		Radio Korea (South), Seoul	9750	15575		
1300-1400		Radio Moscow, USSR	7315	7370	9650	9755
			11840	11900	12050	15220
			15540	15320	15490	15550
			15565	15595	17570	17645
			17660	17815	17830	21630
			21725			
1300-1400		Radio Peace and Progress, USSR	17635	17730		
1300-1400		Radio RSA, South Africa	11805	17730	21590	
1300-1400	A,S	Radio Tanzania, Dar es Salaam	7165			
1300-1400		SBC Radio One, Singapore	5010	5052	11940	
1300-1400	A,S	Superpower KUSW, Utah	9850			
1300-1400		Voice of America, Washington	6110	9760	11715	15155
			15160	15425		
1300-1400		Voice of Malaysia	7295			
1300-1400		WHRI, Noblesville, Indiana	9465	11790		
1300-1400	IRR	WWCR, Nashville, Tennessee	15690			
1300-1400		WYFR, Oakland, California	5950	6010	9680	11580
			11830	13695	15055	15215
			15365			
1330-1345		Radio Korea, Seoul, South Korea	7275	11740		
1330-1400		BBC, London, England	5995	6195	7180	9410
			9740	11750	11940	15070
			15140	15310	17640	17790
			17885	21470	21710	25750
1330-1400		All India Radio, New Delhi	9545	10330	11810	15335
1330-1400		Laotian National Radio	7113			
1330-1400	S	Radio Finland, Helsinki	15400	21550		
1330-1400		Radio Tashkent, Uzbek, USSR	5945	9540	9600	11785
			15460			
1330-1400		Swiss Radio Int'l, Berne	9620	11695	13635	15570
			17830	21695		
1330-1400		UAE Radio, United Arab Emirates	15435	17775	21605	
1330-1400		Voice of Islamic Republic Iran	9525	9685	9770	
1330-1400		Voice of Kenya, Nairobi	6100			
1330-1400		Voice of Vietnam, Hanoi	12010	15010		
1332-1400	A	Trans World Radio, Bonaire	11815	15345		
1345-1400		Radio Berlin Int'l, East Germany	9730			

1400 UTC [10:00 AM EDT/7:00 AM PDT]

1400-1427		Voice of Nigeria, Lagos	15120	
1400-1430		ABC, Alice Springs, Australia	2310	[ML]
1400-1430		ABC, Tennant Creek, Australia	2325	[ML]





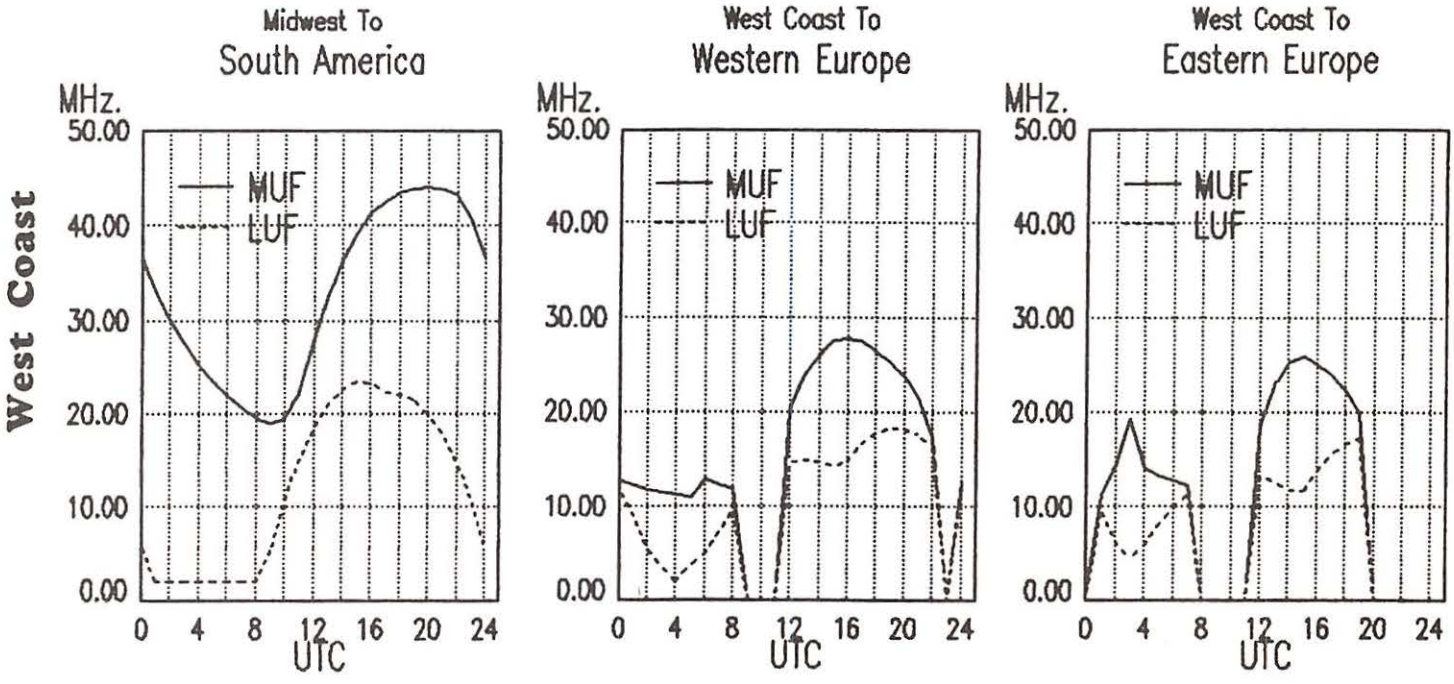


frequency section

1400-1430		Radio Finland, Helsinki	9560	11715	11925	15185	17800
1400-1430		Radio France Int'l, Paris	21770				
1400-1430	S	Radio Norway Int'l, Oslo	21710				
1400-1430		Radio Polonia, Warsaw, Poland	6095	7285			
1400-1430		R.Station Peace & Progress USSR	11890	15220	17610	17635	17645
1400-1430		Radio Sweden Int'l, Stockholm	17740	21610			
1400-1430		Radio Tirana, Albania	9500	11985			
1400-1430		Voice of Ethiopia, Addis Ababa	9550	11710			
1400-1450	T	Radio Free Europe, Munich*	5985	7115	7695	9725	11895 15355
1400-1450		Radio Pyongyang, North Korea	6576	11735			
1400-1455		Radio Beijing, China	7405	11600	11855	15165	
1400-1500		ABC, Katherine, Australia	2485				
1400-1500		ABC, Perth, Australia	9610				
1400-1500		Adventist World Radio, Italy	7275				
1400-1500		All India Radio, New Delhi	9545	11810	15335		
1400-1500		BBC, London, England	5995	6195	7180	9740	9750 11750 12095 15070 15140 15310 15400 17640 17790 17840 21710 21470 25750
1400-1500		CBN, St. John's, Newfoundland	6160				
1400-1500		CBC Northern Quebec Service	9625	11720			
1400-1500	M-A	CBU, Vancouver, British Colombia	6160				
1400-1500		CFCF, Montreal, Quebec	6005				
1400-1500		CFCN, Calgary, Alberta	6030				
1400-1500		CHNS, Halifax, Nova Scotia	6130				
1400-1500		Christian Science World Service	13760	17555	21780		
1400-1500		CKWX, Vancouver, British Colombia	6080				
1400-1500		CFRB, Toronto, Ontario	6070				
1400-1500	S	ELWA, Monrovia, Liberia	11830				
1400-1500		FEBC, Manila, Philippines	9670	11850			
1400-1500		HCJB, Quito, Ecuador	11740	15115	17890		
1400-1500		Radio Australia, Melbourne	5995	6035	6060	6080	7205 9580 15140 15245
1400-1500	S	Radio Canada Int'l, Montreal	9625	11720	11955	17820	
1400-1500		Radio Japan, Tokyo	9505	9695	11865	11815	15410
1400-1500		Radio Korea, Seoul	9570	9750	15575		
1400-1500		Radio Moscow, USSR	9655	9755	11840	11900	11995 13710 15135 15320 15490 15585 17570 17660 17815 21630
1400-1500		Radio RSA, South Africa	11925	21535	21590	25790	
1400-1500	A,S	Radio Tanzania, Dar es Salaam	7165				
1400-1500		SBC Radio One, Singapore	5010	5052	11940		
1400-1500	A,S	Superpower KUSW, Utah	9850				
1400-1500		Voice of America, Washington	6110	9760	11920	15160	15205 15245 15410 15425 17755
1400-1500		Voice of Kenya, Nairobi	6100				
1400-1500		Voice of Malaysia, Kuala Lumpur	4950				
1400-1500		Voice of Mediterranean, Malta	11925				
1400-1500		WHRI, Noblesville, Indiana	9465	15105			
1400-1500		WYFR, Oakland, California	5950	11830	13695	15215	15580
1400-1500		WYFR Satellite Net, California	13695				
1415-1420		Radio Nepal, Kathmandu	3230	5005			
1430-1500	F	ABC, Alice Springs, Australia	2310	[ML]			
1430-1500	F	ABC, Tennant Creek, Australia	2325	[ML]			
1430-1500		Burma Broadcasting Service	5985				
1430-1500		King of Hope, Southern Lebanon	6280				
1430-1500		KTWR, Agana, Guam	9780				
1430-1500		Radio Austria Int'l, Vienna	6155	11780	13730	21490	
1430-1500		Radio Netherland, Hilversum	5955	13770	15150	17605	
1430-1500		Radio Prague, Czechoslovakia	9605	11685	13715	15110	17705 21505
1430-1500		Radio Sofia, Bulgaria	7245	9740	11735		
1445-1500		Radio Berlin Int'l, East Germany	15240	17880			
1445-1500		Radio Canada Int'l, Montreal	11935	15160	15305	15325	17795 17820 21545
1445-1500	M-A	Radio Ulan Bator, Mongolia	9575	15305			

1500 UTC [11:00 AM EDT/8:00 AM PDT]

1500-1505		Africa No. 1, Gabon	7200	15200			
1500-1510		Vatican Radio, Vatican City	11955	15090	17870		
1500-1600		BBC, London, England	5995	6155	6195	7180	9410 9740 11750 11775 11940 12095 15070 15140 15260 15400 17640 17705 17740 17790 21470 21660 21710 25750
1500-1515		FEBA, Mahe, Seychelles	15325				
1500-1520		Radio Ulan Bator, Mongolia	9575	15305			
1500-1525		Radio Bucharest, Romania	9510	9690	11775	11940	15250 15335

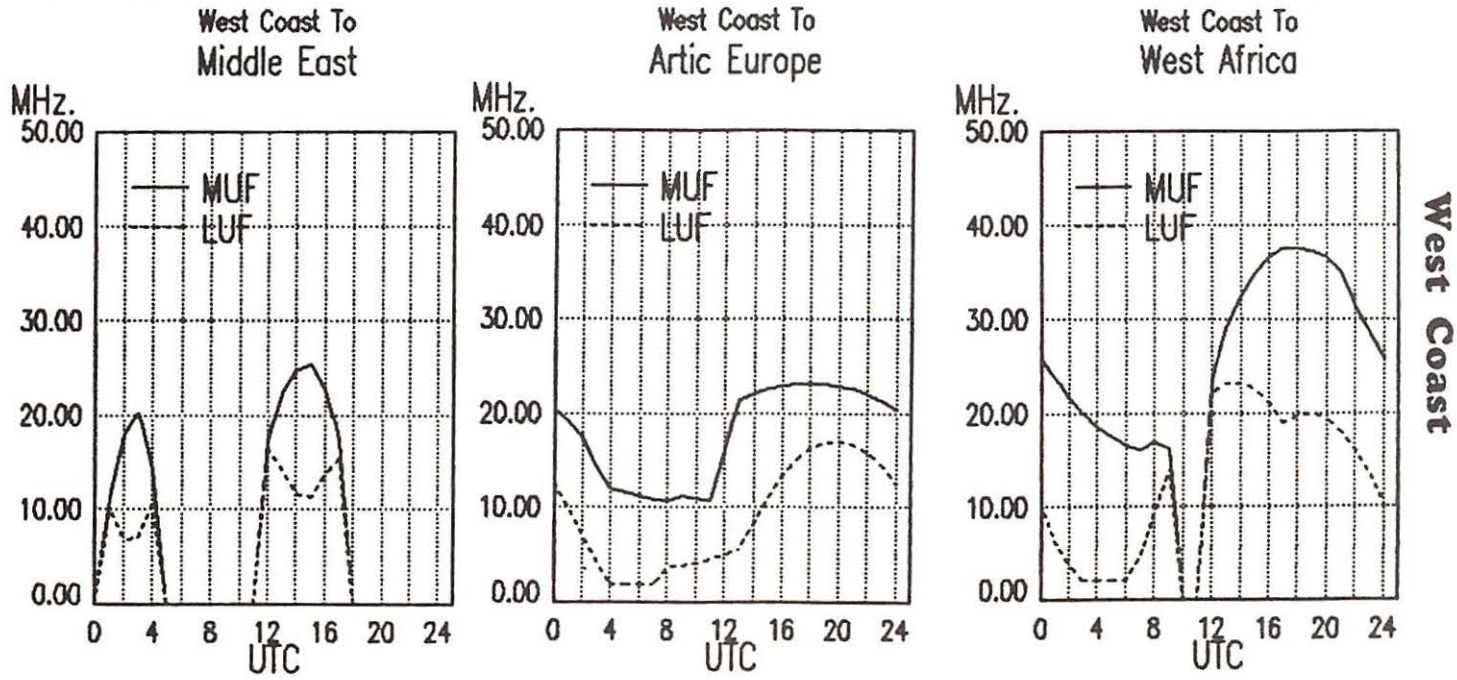


frequency section

1500-1525		Radio Netherland, Hilversum	5955	13770	15150	17605
1500-1530		Radio Berlin Int'l, East Germany	15240	17880		
1500-1530		Radio Sofia, Bulgaria	9560	11735	15310	
1500-1530	A,S	Radio Tanzania, Dar es Salaam	7165			
1500-1530		Radio Veritas Asia, Philippines	9525	9770	15445	
1500-1550		Deutsche Welle, West Germany	9735	11965	17810	21600
1500-1550		Radio Pyongyang, North Korea	6576	9325	9345	9640
			9977	11740		
1500-1555		Radio Beijing, China	7405	11600	11795	15165
1500-1600	F	ABC, Alice Springs, Australia	2310 [ML]			
1500-1600		ABC, Perth, Australia	9610			
1500-1600	F	ABC, Tennant Creek, Australia	2325 [ML]			
1500-1600		AWR, Alajuela, Costa Rica	15460			
1500-1600		Burma Broadcasting Service	5985			
1500-1600		CBC Northern Quebec Service	9625	11720		
1500-1600		CBN, St. John's, Newfoundland	6160			
1500-1600		CBU, Vancouver, British Colombia	6160			
1500-1600		CFCF, Montreal, Quebec	6005			
1500-1600		CFCN, Calgary, Alberta	6030			
1500-1600		CHNS, Halifax, Nova Scotia	6130			
1500-1600		Christian Science World Service	13760	17555	21780	
1500-1600		CKWX, Vancouver, British Colombia	6080			
1500-1600		CFRB, Toronto, Ontario	6070			
1500-1600	S	ELWA, Monrovia, Liberia	11830			
1500-1600		FEBC, Manila, Philippines	11850			
1500-1600		HCJB, Quito, Ecuador	11740	15115	17890	
1500-1600		King of Hope, Southern Lebanon	6280			
1500-1600		KNLS, Anchor Point, Alaska	11700			
1500-1600		KTWR, Agana, Guam	11650			
1500-1600		Radio Australia, Melbourne	5995	6035	6060	6080
			7205	7215	9580	15140
1500-1600	S	Radio Canada Int'l, Montreal	9625	11720	11955	17820
1500-1600		Radio Japan, Tokyo	11815	11865	15195	21700
1500-1600		Radio Jordan, Amman	9560			
1500-1600		Radio Korea (South), Seoul	9870			
1500-1600		Radio Moscow, USSR	9655	9755	11840	11900
			11995	12030	12050	15135
			15295	15490	15540	15585
			17660			
1500-1600		Radio RSA, South Africa	11925	21535	21590	25790
1500-1600		SBC Radio One, Singapore	5010	5052	11940	
1500-1600		SLBC, Sri Lanka	9720			
1500-1600		Superpower KUSW, Utah	15650			
1500-1600		Voice of America, Washington	6110	9575	9645	9700
			9760	15205	15260	
1500-1600		Voice of Ethiopia, Addis Ababa	7165	9560		
1500-1600		Voice of Indonesia, Jakarta	11790	15150		
1500-1600		Voice of Kenya, Nairobi	6100			
1500-1600		Voice of Malaysia, Kuala Lumpur	4950			
1500-1600		Voice of Mediterranean, Malta	11925			
1500-1600		WHRI, Noblesville, Indiana	15105	21840		
1500-1600		WRNO, New Orleans, Louisiana	11965			
1500-1600	IRR	WWCR, Nashville, Tennessee	15690			
1500-1600		WYFR, Oakland, California	5950	11580		
1500-1600		WYFR Satellite Net	11830	13695	15215	
1515-1530	M-H	Radio Budapest, Hungary	7220	9585	9835	11910
			15160	15220		
1515-1600		FEBA, Mahe, Seychelles	11865	15325		
1515-1600		Radio Berlin Int'l, East Germany	6115	7295	9730	15255
1530-1545		All India Radio, New Delhi	3905	3925	4860	6160
			7160	7412	9545	9950
1530-1555		BRT, Brussels, Belgium	17595	21810		
1530-1600		Radio Prague, Czechoslovakia	6055	7395	9605	11685
			11990	13715	15110	15155
			17705	21505		
1530-1600		Radio Sweden, Stockholm	17880	21610	21675	
1530-1600		Radio Tanzania, Dar es Salaam	9684			
1530-1600		Radio Tirana, Albania	9480	11835		
1530-1600		Radio-Television Morocco, Rabat	17595			
1530-1600		Swiss Radio Int'l, Berne	13685	15430	17830	21630
1530-1600		Voice of Asia, Taiwan	5980	7445		
1530-1600		Voice of Nigeria, Lagos	15120			
1530-1540	M-A	Voice of Greece, Athens	15630	17550		
1545-1600		Radio Berlin Int'l, East Germany	7295	9730	15340	17775
1545-1600		Vatican Radio, Vatican City	15120	17730	21650	
1545-1600		Voice of Vietnam, Hanoi	10011	11750		
1550-1600	H-S	KTWR, Agana, Guam	9780			

1600 UTC [12:00 PM EDT/9:00 AM PDT]

1600-1605		SBC Radio One, Singapore	5010	5052	11940	
1600-1610		FEBA, Mahe, Seychelles	11865	15325		
1600-1610		Radio Lesotho, Maseru	4800			
1600-1625		Radio Budapest, Hungary	6110	9585	9835	11910
			15160			
1600-1625		Radio Prague, Czechoslovakia	6055	9605	11665	11685
			11990	13715	15110	15155
			17705	21505		
1600-1630		ELWA, Monrovia, Liberia	11830			

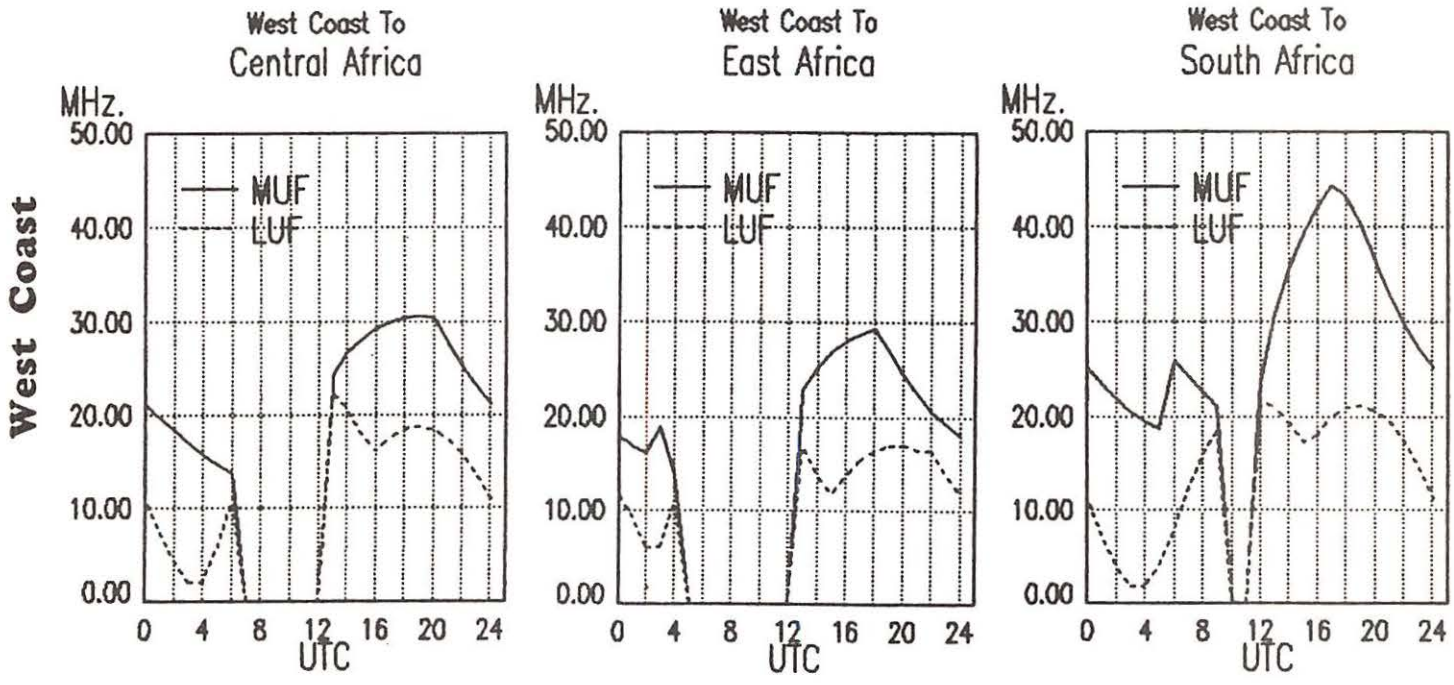


frequency section

1600-1630		HCJB, Quito, Ecuador	15115	17890		
1600-1630		Radio Berlin Int'l, East Germany	7295	9730	15355	17780
1600-1630	S	Radio Norway Int'l, Oslo	15310	17780		
1600-1630		Radio Pakistan, Islamabad	7365	9465	9785	11615
			11625	15125		
1600-1630		Radio Polonia, Warsaw, Poland	6135	9540		
1600-1630	M-F	Radio Portugal, Lisbon	15120			
1600-1630		SLBC, Colombo, Sri Lanka	6075	9720		
1600-1630		Trans World Radio, Swaziland	5055	9525		
1600-1630		Voice of Asia, Taiwan	5980	7445		
1600-1630		Voice of Vietnam, Hanoi	12020	15010		
1600-1645		Radio Nacional Angola, Luanda	7245	9535	11955	
1600-1645		UAE Radio, United Arab Emirates	11730	15435	17865	
1600-1650		Deutche Welle, West Germany	6170	7200	9745	15105
			15595	17825	21680	
1600-1655		Radio Beijing, China	9570	11600	11715	15110
1600-1700	F	ABC, Alice Springs, Australia	2310	[ML]		
1600-1700		ABC, Perth, Australia	9610			
1600-1700	F	ABC, Tennant Creek, Australia	2325	[ML]		
1600-1700		AWR, Alajuela, Costa Rica	15460			
1600-1700		BBC, London, England	5975	5995	6195	7180
			9740	9410	11640	11750
			11775	11810	12095	15070
			15260	15400	17640	17705
			17880	21470	21710	25750
1600-1700		CBC Northern Quebec Service	9625	11720		
1600-1700		CBN, St. John's, Newfoundland	6160			
1600-1700		CBU, Vancouver, British Colombia	6160			
1600-1700		CFCF, Montreal, Quebec	6005			
1600-1700		CFCN, Calgary, Alberta	6030			
1600-1700		CHNS, Halifax, Nova Scotia	6130			
1600-1700		Christian Science World Service	21640			
1600-1700		CKWX, Vancouver, British Colombia	6080			
1600-1700		CFRB, Toronto, Ontario	6070			
1600-1700		KNLS, Anchor Point, Alaska	12025			
1600-1700		KSDA, Guam	11980			
1600-1700		KTWR, Guam	11650			
1600-1700		Radio Australia, Melbourne	5995	6035	6060	6080
			7205	7215	9580	15245
1600-1700		Radio Beijing, China	15130			
1600-1700		Radio France Int'l, Paris	6175	11705	15360	17620
			17795			
1600-1700		Radio Jordan, Amman	9560			
1600-1700		Radio Korea, Seoul, South Korea	5985	9870		
1600-1700		Radio Malawi, Blantyre	3380	5995		
1600-1700		Radio Moscow, USSR	9655	11840	11900	11995
			12030	12050	15135	15295
			15425	15540	15585	17685
1600-1700		Radio for Peace, Costa Rica	21565	25945		
1600-1700		Radio Riyadh, Saudi Arabia	9705	9720		
1600-1700		Radio Tanzania, Dar es Salaam	9684			
1600-1700		Superpower KUSW, Utah	15650			
1600-1700		Voice of America, Washington, DC	9575	9645	9760	11920
			15205	15410	15445	15580
			15600	17785	17800	17870
1600-1700		WHRI, Noblesville, Indiana	11790	21840		
1600-1700		WINB, Red Lion, Pennsylvania	15295			
1600-1700		WRNO, New Orleans, Louisiana	11965			
1600-1700	IRR	WWCR, Nashville, Tennessee	15690			
1600-1700		WYFR, Oakland, California	11580	15345	17845	21525
			21615			
1600-1700		WYFR Satellite Network	13695	15170	15215	
1600-1700		Radio Zambia, Lusaka	9580			
1605-1700	F,A	SBC Radio One, Singapore	5052	11940		
1615-1630		Radio Canada Int'l, Montreal	15305	15325	17795	17820
			21545			
1615-1630		Voice of Vietnam, Hanoi	10011	11750		
1630-1700	A	Radio Austria Int'l, Vienna	6155	11780	13730	21490
1630-1700		Radio Netherlands, Hilversum	6020	15570		
1630-1700		Radio Peace & Progress, USSR	6110	6135	9830	11670
			11695	11910	11775	12055
			17595	17615		
1630-1700		RTM Morocco	17595	17815		
1645-1700		Radio Canada Int'l, Montreal	15305	15325	17795	17820
1645-1700		Radio Korea (South), Seoul	5975	7275	9870	

1700 UTC [1:00 PM EDT/10:00 AM PDT]

1700-1705		Radio Uganda, Kampala	4976	5026		
1700-1715		Kol Israel, Jerusalem	9385	11585	13750	
1700-1715	M-A	Voice of Namibia (Angola)	11955			
1700-1725		Radio Netherland, Hilversum	6020	15570		
1700-1730		Radio Australia, Melbourne	5995	6060	6080	7205
			9580	15140	15245	
1700-1730		Radio Japan, Tokyo	9695	11815	11865	
1700-1730	S	Radio Norway Int'l, Oslo	17780	25730		
1700-1730		Radio Sweden Int'l, Stockholm	6065	9655		
1700-1730		SLBC, Colombo, Sri Lanka	11800			

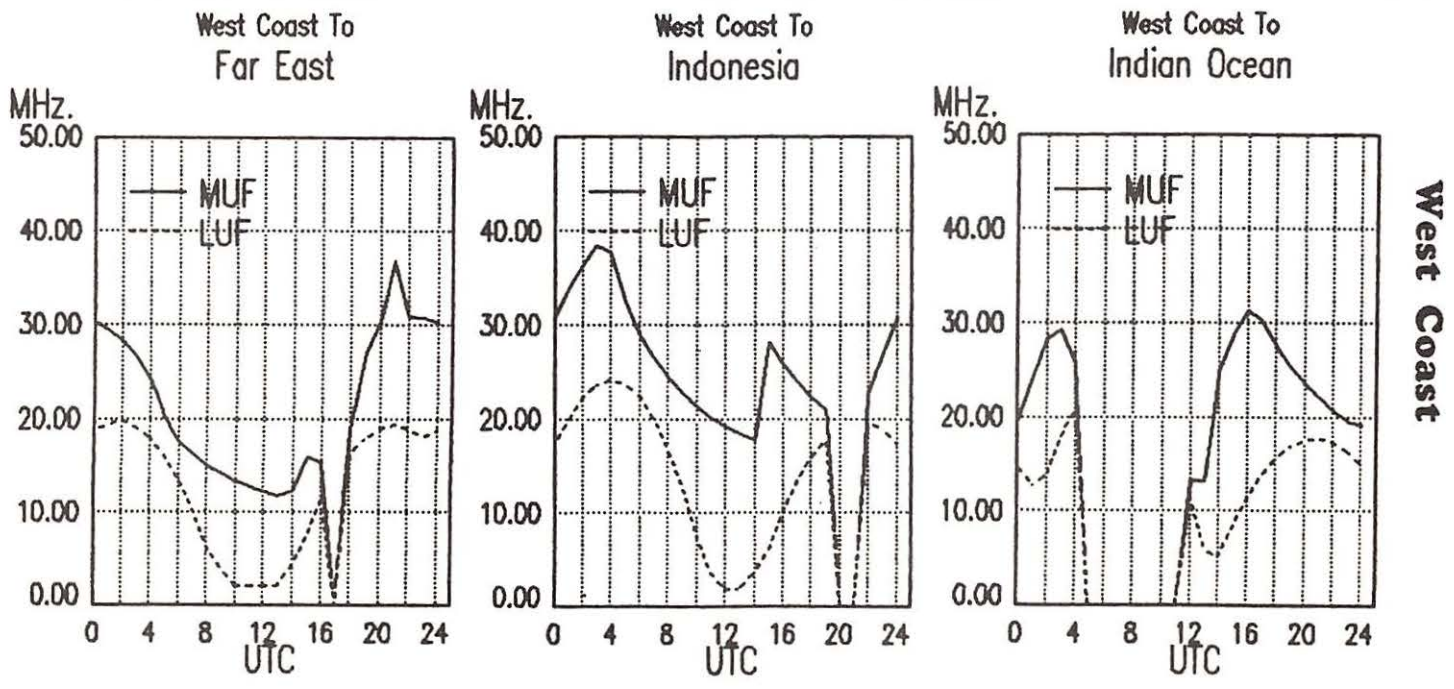


frequency section

1700-1745		BBC, London, England	9410	9740	11750	11775
			11940	12095	15070	15260
			15310	15400	17640	17695
			17880	21470		
1700-1750		Radio Pyongyang, North Korea	7290	9345	9640	9977
			11760			
1700-1755		Radio Beijing, China	9570	9750	11600	
1700-1800	F	ABC, Alice Springs, Australia	2310 [ML]			
1700-1800		ABC, Tennant Creek, Australia	2325 [ML]			
1700-1800		AWR Africa, Gabon	9625			
1700-1800		CBC Northern Quebec Service	9625	11720		
1700-1800		CBN, St. John's, Newfoundland	6160			
1700-1800		CBU, Vancouver, British Colombia	6160			
1700-1800		CFCF, Montreal, Quebec	6005			
1700-1800		CFCN, Calgary, Alberta	6030			
1700-1800		CHNS, Halifax, Nova Scotia	6130			
1700-1800		Christian Science World Service	21640			
1700-1800		CKWX, Vancouver, British Colombia	6080			
1700-1800		CFRB, Toronto, Ontario	6070			
1700-1800		Radio Havana Cuba	11920			
1700-1800		Radio Jordan, Amman	9560			
1700-1800		Radio Korea, Seoul, South Korea	5975	9870	15575	
1700-1800	M-F	Radio Malabo, Equatorial Guinea	9553 [ML]			
1700-1800		Radio Moscow, USSR	9540	9755	9795	9825
			9895	11730	11840	11900
			11995	12015	12030	12050
			15135	15245	15295	15540
			15585	15615	17570	17595
1700-1800		Radio for Peace, Costa Rica	21565	25945		
1700-1800		Radio Riyadh, Saudi Arabia	9705	9720		
1700-1800		Radio Tanzania, Dar es Salaam	9684			
1700-1800		Radio Zambia, Lusaka	9580			
1700-1800		RTM Morocco	17815			
1700-1800		SBC Radio One, Singapore	5052	11940		
1700-1800		Superpower KUSW, Utah	15650			
1700-1800	A,S	Swaziland Commercial Radio	6155			
1700-1800		Voice of Africa, Egypt	15255			
1700-1800		Voice of America, Washington	6110	9575	9645	9760
			11760	11920	15205	15410
			15445	15580	15600	17785
			17800	17870		
1700-1800		Voice of Kenya, Nairobi	6100			
1700-1800		WHRI, Noblesville, Indiana	13760	15105		
1700-1800		WINB, Red Lion, Pennsylvania	15295			
1700-1800	S-F	WMLK, Bethel, Pennsylvania	9465			
1700-1800		WRNO, Louisiana	15420			
1700-1800	IRR	WWCR, Nashville, Tennessee	15690			
1700-1800		WYFR Satellite Net	13695	15170	15215	
1700-1800		WYFR, Okeechobee, Florida	11580	13770	15170	21615
1715-1730	M-F	Radio Canada Int'l, Montreal	5995	7235	15325	17820
1715-1745		BBC, London, England*	3975	6185	7165	
1718-1800		Radio Pakistan, Islamabad	6210			
1725-1740		Radio Suriname Int'l, Paramibo	17835v			
1725-1800		Radio New Zealand, Wellington	11780	15150		
1730-1735		All India Radio, New Delhi	4840	4860	4920	6160
			7412	9950		
1730-1755		BRT, Brussels, Belgium	5915	11695		
1730-1755		Radio Austria Int'l, Vienna	5945	6155	12010	13730
1730-1755		Radio Bucharest, Romania	7105	9530	9685	11790
			11940	15270	15340	17745
1730-1800		Radio Australia, Melbourne	5995	6035	6060	6080
			7205	9580	15245	
1730-1800		Radio Berlin Int'l, East Germany	9665	13610	15145	15255
1730-1800		Radio Polonia, Warsaw, Poland	6135	9540		
1730-1800		Radio Prague, Czechoslovakia	9605	11685	11990	13715
			15110	21505		
1730-1800		RAE, Buenos Aires, Argentina	15345			
1730-1800		Swiss Radio Int'l, Berne	3985	6165	9535	
1734-1800		FEBA, Mahe, Seychelles	11810			
1745-1800		BBC, London, England	9410	9740	11750	12095
			15070	15310	15400	17640
			17695	17880	21470	

1800 UTC [2:00 PM EDT/11:00 AM PDT]

1800-1805	A	SBC Radio One, Singapore	11940			
1800-1815		Radio Cameroon, Yaounde	3970	4750	4795	4850
			5010			
1800-1815		SLBC, Colombo, Sri Lanka	11800			
1800-1825	A,S	FEBA, Mahe, Seychelles	11760			
1800-1825		Radio Prague, Czechoslovakia	5930	7345	9605	11685
			11990	13715	15110	17840
			21505			
1800-1825		RAE, Buenos Aires, Argentina	15345			
1800-1830		BBC, London, England	7325	9410	9740	11750
			12095	15070	15310	15400
			15420	17640	17695	17880
			17885			
1800-1830	S	Radio Bamako, Mali	4835	5995		

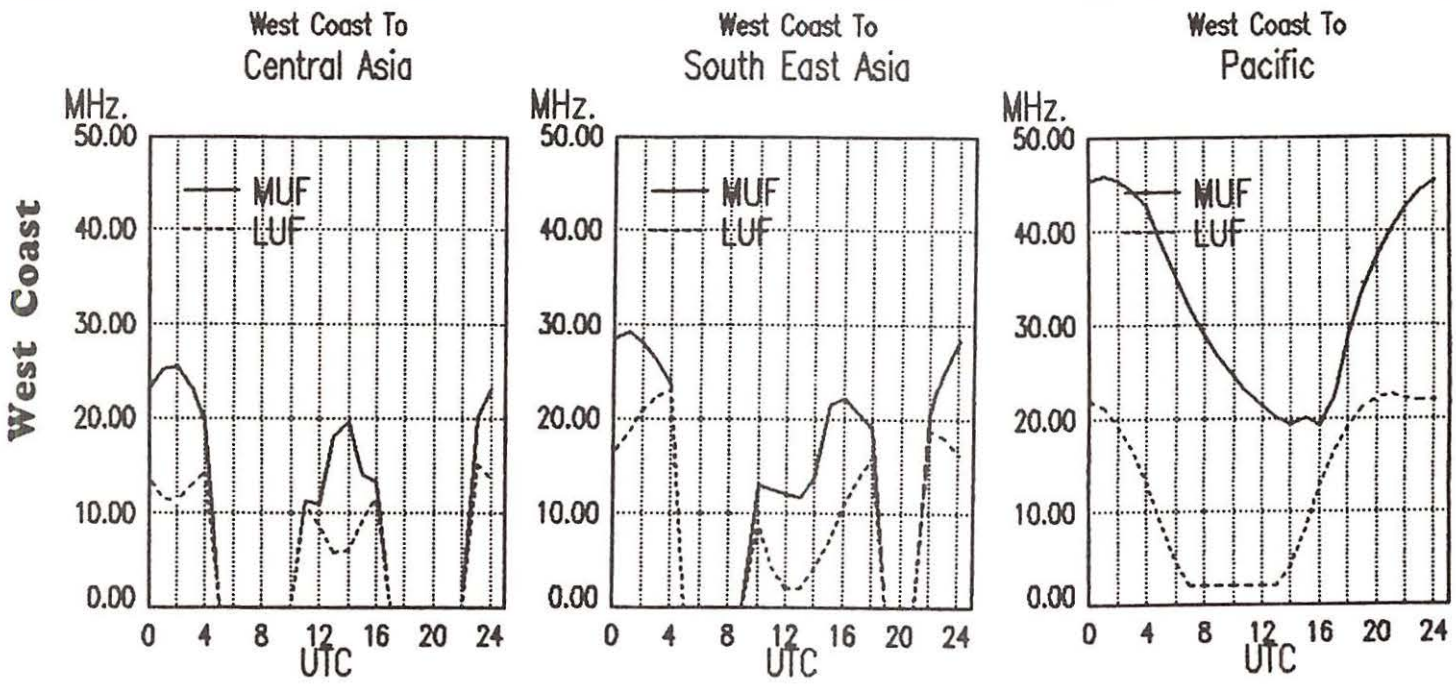


frequency section

1800-1830	M-F	Radio Canada Int'l, Montreal	15260	17820			
1800-1830		Radio Mozambique, Maputo	3265	4855	9618		
1800-1830	S	Radio Norway, Oslo	21730				
1800-1830		Voice of Africa, Egypt	15255				
1800-1830		Voice of Vietnam, Hanoi	12020	15010			
1800-1845		Radio Abidjan, Ivory Coast	11920				
1800-1845		Trans World Radio, Swaziland	9525				
1800-1850		Radio Bras, Brasilia, Brazil	15265				
1800-1856		Radio RSA, South Africa	17795	21535	21590		
1800-1900	F	ABC, Alice Springs, Australia	2310	[ML]			
1800-1900	F	ABC, Tennant Creek, Australia	2325	[ML]			
1800-1900		All India Radio, New Delhi	11935	15360			
1800-1900		CBC Northern Quebec Service	9625	11720			
1800-1900		CBN, St. John's, Newfoundland	6160				
1800-1900		CBU, Vancouver, British Colombia	6160				
1800-1900		CFCF, Montreal, Quebec	6005				
1800-1900		CFCN, Calgary, Alberta	6030				
1800-1900		CHNS, Halifax, Nova Scotia	6130				
1800-1900		Christian Science World Service	21640				
1800-1900		CKWX, Vancouver, British Colombia	6080				
1800-1900		CFRB, Toronto, Ontario	6070				
1800-1900		KNLS, Anchor Point, Alaska	11945				
1800-1900		Radio Australia, Melbourne	5995	6035	6060	6080	
			7205	7215	9580		
1800-1900	A,S	Radio Canada Int'l. Montreal	15260	17820			
1800-1900		Radio Jamahiriya, Libya	15450				
1800-1900		Radio Jordan, Amman	9560				
1800-1900		Radio Kuwait, Kuwait	11665				
1800-1900		Radio Malabo, Equatorial Guinea	9553v	[ML]			
1800-1900		Radio Moscow, USSR	9755	9825	9895	11730	
			11840	11990	12030	12050	
			13605	15135	15245	15265	
			15295	15405	15425	15585	
			15475	17570			
1800-1900		Radio New Zealand, Wellington	11780	15150			
1800-1900		Radio for Peace, Costa Rica	21565	25945			
1800-1900		Radio Riyadh, Saudi Arabia	9705	9720			
1800-1900		Radio Tanzania, Dar es Salaam	9684				
1800-1900		Radio Zambia, Lusaka	9580				
1800-1900		Superpower KUSW, Utah	15650				
1800-1900	A,S	Swaziland Commercial Radio	6155				
1800-1900		Voice of America, Washington	9575	9760	11760	11920	
			15205	15410	15445	15580	
			15600	17785	17800	17870	
1800-1900		Voice of Ethiopia	9662				
1800-1900		Voice of Kenya, Nairobi	6100				
1800-1900		WHRI, Noblesville, Indiana	13760	17830			
1800-1900		WINB, Red Lion, Pennsylvania	15295				
1800-1900	S-F	WMLK, Bethel, Pennsylvania	9465				
1800-1900		WRNO, New Orleans, Louisiana	15420				
1800-1900	IRR	WWCR, Nashville, Tennessee	15690				
1800-1900		WYFR, Oakland, California	11580	15215	15345		
1800-1900		WYFR Satellite Net, California	11830	13695	15170		
1815-1900		Radio Bangladesh, Dhaka	6240	7505	11510	15510	
1800-1855		Radio Polonia, Warsaw, Poland	5995	6135	7125	7285	
			9525	11840			
1830-1855		BRT Brussels, Belgium	5915	11695			
1830-1900		BBC, London, England	7325	9410	9740	11750	
			12095	15070	15400	17695	
			17880				
1830-1900		Radio Berlin Int'l, E. Germany	9665	13610	15145	15255	
1830-1900	M-F	Radio Canada Int'l, Montreal	9555	15325	17875	21675	
1830-1900		Radio Korea, Seoul, South Korea	9870	15575			
1830-1900	MWF	Radio Mozambique, Maputo	3265	4855	9618		
1830-1900		Radio Netherland, Hilversum	6020	15560	17605	21685	
1830-1900		Radio Sofia, Bulgaria	7245	9560	11735	15330	
1830-1900		Swiss Radio International, Berne	9885	11955			
1840-1850	M-A	Voice of Greece, Athens	11645	12045	15630		
1840-1900		Radio Senegal, Dakar	4950				
1845-1855		Radio Nacional, Conaky, Guinea	4833	4900	7125		
1845-1900		All India Radio, New Delhi	7412	11620			

1900 UTC [3:00 PM EDT/12:00 PM PDT]

1900-1903		Africa No. 1, Gabon	15475				
1900-1905	M-A	Vatican Radio, Vatican City	6190	6248	7250	9645	
1900-1915		Radio Bangladesh, Dhaka	6240	7505	11510		
1900-1915		Radio Tanzania, Dar es Salaam	9684				
1900-1925		Radio Netherland, Hilversum	6020	15560	17605	21685	
1900-1925		Voice of Islamic Republic Iran	9695				
1900-1930	F	ABC, Alice Springs, Australia	2310	[ML]			
1900-1930	F	ABC, Tennant Creek, Australia	2325	[ML]			

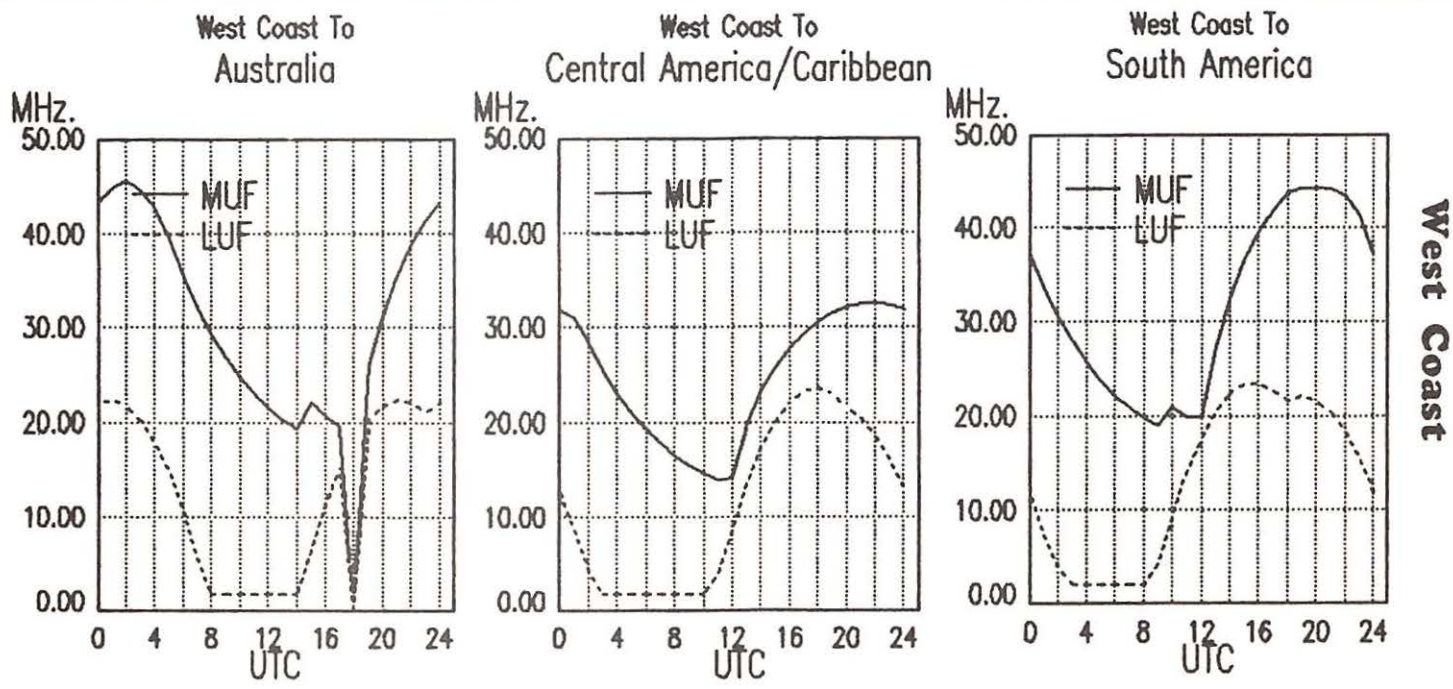


frequency section

1900-1930		Kol Israel, Jerusalem	11605	15640	13750	17590
			17630			
1900-1930		Radio Afghanistan, Kabul	7160	7310	9640	
1900-1930		Radio Berlin Int'l, East Germany	9665	11920	15255	
1900-1930	M-F	Radio Canada Int'l, Montreal	15260	17820		
1900-1930		Radio Japan, Tokyo	9695	11850	11865	15270
1900-1930	S	Radio Norway Int'l, Oslo	15220	21705		
1900-1930	M-F	Radio Portugal, Lisbon	11740	11870	15250	
1900-1930		Radio Sofia, Bulgaria	7245	9560	11735	15310
1900-1930		Voice of Vietnam, Hanoi	9840	12020	15010	
1900-1950		Deutsche Welle, Koln, W. Germany	9745	11810	13790	15390
1900-1955		Radio Beijing, China	6860	9470		
1900-2000		All India Radio, New Delhi	7412	11620	11935	15360
1900-2000		BBC, London, England	9410	9740	11750	12095
			15070	15140	15400	17695
			17880			
1900-2000		CBC Northern Quebec Service	9625	11720		
1900-2000		CBN, St. John's, Newfoundland	6160			
1900-2000		CBU, Vancouver, British Colombia	6160			
1900-2000		CFCF, Montreal, Quebec	6005			
1900-2000		CFCN, Calgary, Alberta	6030			
1900-2000		CHNS, Halifax, Nova Scotia	6130			
1900-2000		Christian Science World Service	21640			
1900-2000		CKWX, Vancouver, British Colombia	6080			
1900-2000		CFRB, Toronto, Ontario	6070			
1900-2000		HCJB, Quito, Ecuador	15270	17790	21470	
1900-2000		Radio Algiers, Algeria	9509	9685	15215	17745
1900-2000		Radio Australia, Melbourne	6035	6060	6080	7205
			7215	9580	15140	
1900-2000		Radio Ghana, Accra	6130			
1900-2000		Radio Havana Cuba	11800			
1900-2000		Radio Jordan, Amman	9560			
1900-2000		Radio Kuwait, Kuwait	11665			
1900-2000	M-A	Radio Malabo, Equatorial Guinea	9553	[ML]		
1900-2000		Radio Moscow, USSR	11730	11840	12030	12050
			13605	15135	15425	15540
			17570			
1900-2000		Radio Moscow British Service	7240	7350	9450	9695
1900-2000		Radio New Zealand, Wellington	11780	15150		
1900-2000		Radio Prague, Czechoslovakia	5930	7345	11855	
1900-2000		Radio Riyadh, Saudi Arabia	9705	9720		
1900-2000		Radio RSA, South Africa	7270	11900	15365	
1900-2000		Radio Zambia, Lusaka	9580			
1900-2000		Spanish Foreign Radio, Madrid	11790	15280	15375	15395
1900-2000		Superpower KUSW, Utah	15650			
1900-2000	A,S	Swaziland Commercial Radio	6155			
1900-2000		Trans World Radio Swaziland	3205			
1900-2000		Voice of America, Washington	9525	9700	9760	11760
			11870	15180	15205	15410
			15445	15580	15600	17740
			17785	17800	17870	
1900-2000		Voice of Ethiopia, Addis Ababa	9595			
1900-2000		Voice of Kenya, Nairobi	6100			
1900-2000		Voice of Nigeria, Lagos	7255	11770		
1900-2000		WHRI, Noblesville, Indiana	13760	17830		
1900-2000		WINB, Red Lion, Pennsylvania	15295			
1900-2000	S-F	WMLK, Bethel, Pennsylvania	9465			
1900-2000		WRNO, New Orleans, Louisiana	15420			
1900-2000	IRR	WWCR, Nashville, Tennessee	15690			
1900-2000		WYFR, Oakland, California	11580	15215	15566	21615
1900-2000		WYFR Satellite Net, California	11830	13695	15170	
1910-1920		Radio Botswana, Gaborone	3356	4820		
1915-2000		Radio Berlin Int'l, East Germany	9665	13610	15255	
1920-1930	M-A	Voice of Greece, Athens	7430	9395	9425	
1930-1940		Radio Togo, Lome	5047			
1930-2000		ABC, Katherine, Australia	2485			
1930-2000		Radio Beijing, China	6955	7480	9440	
1930-2000		Radio Austria Int'l, Vienna	5945	6155	12010	13730
1930-2000		Radio Bucharest, Romania	7145	9690	9750	11940
1930-2000		Radio Korea, Seoul, South Korea	9870	15575		
1930-2000		Voice of Republic of Iran	6080	9022		
1930-2000		WINB, Red Lion, Pennsylvania	15185			
1935-1955		RAI, Rome, Italy	7275	7290	9575	
1940-2000	M-A	Radio Ulan Bator, Mongolia	9575	11870		
1945-2000		All India Radio, New Delhi	9755	11860		
1950-2000		Vatican Radio, Vatican City	6190	7250	9645	

2000 UTC [4:00 PM EDT/1:00 PM PDT]

2000-2005		Radio Zambia, Lusaka	3345	6165	
2000-2010	A	Radio Zambia, Lusaka	3345	6165	
2000-2010		Voice of Kenya, Nairobi	6100		
2000-2015		Radio Togo, Lome	3220	5047	



frequency section

2000-2015	M-A	Radio Ulan Bator, Mongolia	9575	11870			
2000-2015		Trans World Radio, Swaziland	3205				
2000-2025		Radio Beijing, China	6955	7480	9440	9745	
			11715				
2000-2025		Radio Bucharest, Romania	5990	6105	7145	7195	
			9750	9690	11940		
2000-2030		Radio Australia, Melbourne	6035	7205	7215	9580	
			9620				
2000-2030		Radio Berlin Int'l, East Germany	6115				
2000-2030		Radio Budapest, Hungary	6110	7220	9585	9835	
			11910	15160			
2000-2030		Radio Ghana, Nairobi	3366	4915			
2000-2030		Radio Polonia, Warsaw, Poland	7125	7145	9525		
2000-2030		Swaziland Commercial Radio	6155				
2000-2030		Voice of Nigeria, Lagos	7255				
2000-2030		Voice of Republic of Iran	6080	9022			
2000-2045		All India Radio, New Delhi	7412	9755	9910	11620	
			11860				
2000-2050		Radio Pyongyang, North Korea	6576	9345	9640	9977	
2000-2050		Voice of Turkey, Ankara	9825				
2000-2100	M-A	ABC, Alice Springs, Australia	2310	[ML]			
2000-2100		ABC, Katherine, Australia	2485				
2000-2100	M-A	ABC, Tennant Creek, Australia	2325	[ML]			
2000-2030		BBC, London, England	5975	9410	11715	11750	
			11820	12095	15070	15140	
			15260	15400	17695	17760	
			17755	17880			
2000-2055		Radio Beijing, China	6955	7480	9440	9745	
			11790				
2000-2100		CBC Northern Quebec Service	9625	11720			
2000-2100		CBN, St. John's, Newfoundland	6160				
2000-2100		CBU, Vancouver, British Colombia	6160				
2000-2100		CFCF, Montreal, Quebec	6005				
2000-2100		CFCN, Calgary, Alberta	6030				
2000-2100		CHNS, Halifax, Nova Scotia	6130				
2000-2100		Christian Science World Service	15390	17555	21640		
2000-2100		CKWX, Vancouver, British Colombia	6080				
2000-2100		CFRB, Toronto, Ontario	6070				
2000-2100		King of Hope, Southern Lebanon	6280				
2000-2100		KVOH, Rancho Simi, California	17775				
2000-2100		Radio Baghdad, Iraq	13660				
2000-2100		Radio Havana Cuba	11800				
2000-2100		Radio Jordan, Amman	9560				
2000-2100		Radio Kuwait, Kuwait	11665				
2000-2100		Radio Malabo, Equatorial Guinea	9553v				
2000-2100		Radio Moscow, USSR	11675	11730	11820	11840	
			12030	12050	13605	15295	
			15535	21630			
2000-2100		Radio New Zealand, Wellington	12050	15150			
2000-2100	A,S	Radio for Peace, Costa Rica	21565	25945			
2000-2100		Radio Riyadh, Saudi Arabia	9705	9720			
2000-2100		Radio Tonga, Tonga	5050				
2000-2100		Radio Zambia, Lusaka	9580				
2000-2100		Superpower KUSW, Utah	15650				
2000-2100		Voice of America, Washington	9700	9760	11760	15205	
			15410	15445	15580	15600	
			17785	17800	17870		
2000-2100		Voice of Nigeria, Lagos	11770				
2000-2100		WHRI, Noblesville, Indiana	13760	17830			
2000-2100		WINB, Red Lion, Pennsylvania	15185				
2000-2100	S-F	WMLK, Bethel, Pennsylvania	9465				
2000-2100		WRNO, New Orleans, Louisiana	15420				
2000-2100	IRR	WWCR, Nashville, Tennesee	15690				
2000-2100		WYFR, Oakland, California	11580	15215	15566	17845	
			21525	21615			
2000-2100	M-A	WYFR Satellite Net, California	13695	15170			
2005-2100		Radio Damascus, Syria	15095	17710			
2010-2100	A,S	Voice of Kenya, Nairobi	6100				
2015-2100		ELWA, Monrovia, Liberia	11830				
2025-2045		RAI, Rome, Italy	6165	9575			
2030-2055		Radio Polonia, Warsaw, Poland	6095	7285			
2030-2100		BBC, London, England	5975	7325	9410	11750	
			11920	12095	15070	15140	
			15260	15400	17695	17755	
			17760				
2030-2100		Radio Australia, Melbourne	9580	9620			
2030-2100		Radio Korea, Seoul, South Korea	6480	7550	15575		
2030-2100		Radio Netherland, Hilversum	9860	13700	15560		
2030-2100		Radio Sofia, Bulgaria	7115	7155	9700	11720	
			15290	15330			
2030-2100	M	Radio Tallin, Estonian SSR	5925				
2030-2100		Radio Tirana, Albania	9480	11835			
2030-2100		Voice of Africa, Cairo, Egypt	15375				
2030-2100		Voice of Vietnam, Hanoi	9840	12020	15010		
2045-2100		All India Radio, New Delhi	7412	9550	9910	11620	
			11715				
2045-2100		IBRA Radio, Malta	7110				
2045-2100		Vatican Radio, Vatican City	9625	11700	11695	15120	

2100 UTC [5:00 PM EDT/2:00 PM PDT]

2100-2105		Radio Damascus, Syria	15095	17710			
2100-2105		Radio Zambia, Lusaka	3345	6165			
2100-2110		Vatican Radio, Vatican City	6190	7250	9645		
2100-2110	A,S	Voice of Kenya, Nairobi	6100				
2100-2115		IBRA Radio, Malta	7110				
2100-2125		BRT, Brussels, Belgium	5915	9925			
2100-2125		Radio Beijing, China	6955	7480	9440	9745	
			11790				
2100-2125		Radio Bucharest, Romania	5990	6105	7145	7195	
			9690	9750	11940		
2100-2125		Radio Finland, Helsinki	6120	11755	11845		
2100-2125		Radio Netherland, Hilversum	9860	13700	15560		
2100-2130		Radio Japan, Tokyo	11800	11945	15230	15270	
			17810	17890			
2100-2130		Radio Korea, Seoul, South Korea	6480	7550	15575		
2100-2130		Radio Peace & Progress, USSR	7340	7420	9550	9820	
			11980	15240			
2100-2130		Radio Sweden, Stockholm	9655	11705			
2100-2130		Swiss Radio Int'l, Berne	9885	13635	15570		
2100-2135		ELWA, Monrovia, Liberia	11830				
2100-2145		Radio Berlin Int'l, East Germany	9730				
2100-2145		Radio Yugoslavia, Belgrade	7215	9620	11735	15105	
2100-2150		Radio Baghdad, Iraq	13660				
2100-2200	IRR	WWCR, Nashville, Tennesee	15390				
2100-2200		WYFR, Oakland, California	11580	13695	15170	15215	
			15430	15566	17845	21525	
			21615				
2100-2150		Deutsche Welle, West Germany	9765	13780	15435		
2100-2155		Radio Beijing, China	9860	11500			
2100-2200	M-A	ABC, Alice Springs, Australia	2310	[ML]			
2100-2200		ABC, Katherine, Australia	2485				
2100-2200	M-A	ABC, Tennant Creek, Australia	2325	[ML]			
2100-2200		All India Radio, New Delhi	7412	9910	11620	11715	
2100-2200		BBC, London, England	3995	5975	6005	6175	
			6180	7325	9410	11750	
			12095	15070	15140	15260	
			15400	17755	17760		
2100-2200	M-F	CBC Northern Quebec Service	9625	11720			
2100-2200		CBN, St. John's, Newfoundland	6160				
2100-2200		CBU, Vancouver, British Colombia	6160				
2100-2200		CFCF, Montreal, Quebec	6005				
2100-2200		CFCN, Calgary, Alberta	6030				
2100-2200		CHNS, Halifax, Nova Scotia	6130				
2100-2200		Christian Science World Service	15390	17555	21640		
2100-2200		CKWX, Vancouver, British Colombia	6080				
2100-2200		CFRB, Toronto, Ontario	6070				
2100-2200		King of Hope, Southern Lebanon	6280				
2100-2200		KSDA, Agat, Guam	7365	15125			
2100-2200		KVOH, Rancho Simi, California	17775				
2100-2200		Radio Australia, Melborurne	15160	15240	15395	17795	
2100-2200	A,S	Radio Canada Int'l, Montreal	13660	15325	17875		
2100-2200		Radio Jordan, Amman	9560				
2100-2200		Radio Moscow, USSR	9665	11675	11730	11820	
			11840	11940	11980	12030	
			12050	13605	15295	15425	
			15535	15560			
2100-2200	A,S	Radio Malabo, Equatorial Guinea	9552.5				
2100-2200		Radio Tonga, Tonga	5050				
2100-2200		Radio for Peace, Costa Rica	21565	25945			
2100-2200	A,S	Radio Zambia, Lusaka	9580				
2100-2200		Spanish Foreign Radio, Madrid	11790	15280			
2100-2200	M-A	Superpower KUSW, Utah	15650				
2100-2200		Voice of Africa, Cairo, Egypt	15280				
2100-2200		Voice of America, Washington	9700	9760	11760	15205	
			15410	15445	15580	15600	
			17785	17800	17870		
2100-2200		WHRI, Noblesville, Indiana	13760	17830			
2100-2200		WRNO, New Orleans, Louisiana	13720				
2100-2200		WWCR, Nashville, Tennessee	15690				
2103-2200		WINB, Red Lion, Pennsylvania	15185				
2110-2200		Radio Damascus, Syria	15095	17710			
2110-2200		VOA Pacific Service	9525	11965	15185		
2115-2200		Radio Cairo, Egypt	9900				
2125-2155	S	Radio Austria Int'l, Vienna	9870				
2130-2145		BBC, London, England*	5965	7160			

frequency section

2130-2200		BBC, London, England*	6030	7230	9635		
2130-2200		HCJB, Quito, Ecuador	15270	17790	21470		
2130-2200		Kol Israel, Jerusalem	13750	15640	17575	17630	
2130-2200	A,S	Radio Canada Int'l, Montreal	11880	15150	17820		
2130-2200	M-F	Radio Canada Int'l, Montreal	13660	15325	17875		
2130-2200		Radio Sofia, Bulgaria	11660	15330			
2130-2200		Radio Vilnius, Lithuanian SSR	6100				
2130-2200		Swiss Radio Int'l, Berne	6190				
2135-2150	S-F	ELWA, Monrovia, Liberia	11830				
2145-2200		Radio Berlin Int'l, East Germany	5965	9730			
2150-2200	M-F	ELWA, Monrovia, Liberia	11830				

2200 UTC [6:00 PM EDT/3:00 PM PDT]

2200-2205	M-F	ELWA, Monrovia, Liberia	3993	11830			
2200-2205		Radio Damascus, Syria	15095	17710			
2200-2210		Radio Sierra Leone, Freetown	5980				
2200-2215	M-A	ABC, Alice Springs, Australia	2310	[ML]			
2200-2215	M-A	ABC, Tennant Creek, Australia	2325	[ML]			
2200-2215		BBC, London, England*	5965	7160			
2200-2215	M-F	Voice of America, Washington	9640	11740	15120		
2200-2225		RAI, Rome, Italy	5990	9710			
2200-2225		Vatican Radio, Vatican City	9615	11830	15105		
2200-2230		ABC, Katherine, Australia	2485				
2200-2230		All India Radio, New Delhi	7412	9550	9910	11620	
			11715				
2200-2230		CBC Northern Quebec Service	9625	11720			
2200-2230	S	KGEI, San Francisco, California	15280				
2200-2230		Radio Beijing, China	3985	6165			
2200-2230		Radio Berlin Int'l, East Germany	5965	9730			
2200-2230		Radio Canada Int'l, Montreal	5960	9755	11905		
2200-2230		Radio Jordan, Amman	9560				
2200-2230	S	Radio Norway Int'l, Oslo	25730				
2200-2230		Radio Prague, Czechoslovakia	6055				
2200-2230		Radio Sofia, Bulgaria	11660	15330			
2200-2230		Radio Vilnius, Lithuanian SSR	6100	7400	11675	11790	
			11875	12000	15180	15455	
			17665				
2200-2245		BBC, London, England	3955	5975	6005	6175	
			7325	9410	9590	9915	
			11920	12095	15070	15260	
			15400	17755	17785		
2200-2245		Radio Cairo, Egypt	9900				
2200-2250		Voice of Turkey, Ankara	9445	9685	17760		
2200-2255		RAE, Buenos Aires, Argnetina	11710	15345			
2200-2300		CBN, St. John's, Newfoundland	6160				
2200-2300		CBU, Vancouver, British Colombia	6160				
2200-2300		CFCF, Montreal, Quebec	6005				
2200-2300		CFCN, Calgary, Alberta	6030				
2200-2300		CHNS, Halifax, Nova Scotia	6130				
2200-2300		Christian Science World Service	9465	15300	17555		
2200-2300		CKWX, Vancouver, British Colombia	6080				
2200-2300		CFRB, Toronto, Ontario	6070				
2200-2300		King of Hope, Southern Lebanon	6280				
2200-2300		KVOH, Rancho Simi, California	17775				
2200-2300		Radio Australia, Melbourne	15160	15240	15320	15395	
			17795	21740			
2200-2300		Radio for Peace, Costa Rica	21565	25945			
2200-2300		Radio Havana Cuba	7140				
2200-2300		Radio Moscow, USSR	12055	15560	17570	17605	
			17655	17850			
2200-2300		Radio Moscow North American Svc	9530	9765	11710	11730	
			11750	15245	15290		
2200-2300		Radio Tonga, Tonga	5050				
2200-2300		SBC Radio One, Singapore	5010	5052	11940		
2200-2300	M-A	Superpower KUSW, Utah	15580				
2200-2300		Voice of America, Washington	11760	15185	15290	15305	
			15320	17735	17740	17820	
			18157	USB			
2200-2300		Voice of Free China, Taiwan	9955	15370	15440	17845	
2200-2300		Voice of the UAE, Abu Dhabi	9595	11985	13605		
2200-2300		WHRI, Noblesville, Indiana	13760	17830			
2200-2300		WINB, Red Lion, Pennsylvania	15185				
2200-2300		WRNO, New Orleans, Louisiana	13720				
2200-2300		WWCR, Nashville, Tennessee	15690				
2200-2300		WYFR, Oakland, California	11580	13695	15170	15215	
			21525				
2215-2230		BBC, London, England*	11820	15390			
2230-2300	A,S	CBC Northern Quebec Service	9625	11720			
2230-2300		Radio Mediterran, Malta	6110				
2230-2300		Radio Polonia, Warsaw, Poland	5995	6135	7125	7270	
2230-2300		Radio Tirana, Albania	7215	9480			
2245-2300		All India Radio, New Delhi	6055	7215	9535	9910	
			11715	11745			
2245-2300		BBC, London, England	3955	5975	6005	6175	
			7325	9410	9570	9590	
			9915	11785	11945	12095	
			15260	15400	17875		

2300 UTC [7:00 PM EDT/4:00 PM PDT]

2300-2330		Kol Israel, Jerusalem	11605	15615	15640		
2300-2330		Radio Canada Int'l, Montreal	9755	11730			
2300-2330		Radio Mediterran, Malta	6110				
2300-2330		Radio Norway, Oslo	15190				
2300-2330		Radio Prague, Czechoslovakia	13715				
2300-2345		WINB, Red Lion, Pennsylvania	15145				
2300-2345		WYFR, Oakland, California	5985	11580	15170		
2300-2350		Radio Pyongyang, North Korea	13650				
2300-0000		All India Radio, New Delhi	6055	7215	9535	9910	
			11715	11745			
2300-0000		BBC, London, England	3955	5975	6005	6175	
			7325	9410	9590	9915	
			11945	12095	15260	17875	
2300-0000	M-F	CBC Northern Quebec Service	6195	9625			
2300-0000		CBN, St. John's, Newfoundland	6160				
2300-0000		CBU, Vancouver, British Colombia	6160				
2300-0000		CFCF, Montreal, Quebec	6005				
2300-0000		CFCN, Calgary, Alberta	6030				
2300-0000		CHNS, Halifax, Nova Scotia	6130				
2300-0000		Christian Science World Service	9465	15300	17555		
2300-0000		CKWX, Vancouver, British Colombia	6080				
2300-0000		CFRB, Toronto, Ontario	6070				
2300-0000		KVOH, Rancho Simi, California	17775				
2300-0000		Radio Australia, Melbourne	15160	15240	15320	15395	
			17795	21740			
2300-0000		Radio for Peace, Costa Rica	21555				
2300-0000		Radio Japan, Tokyo	11800	17765	21610		
2300-0000		Radio Luxembourg	6090				
2300-0000		Radio Moscow	11845	12025	12055	17620	
			17850	21690	21790		
2300-0000		Radio Moscow, (N. American Srvc)	9530	9765	11710	11730	
			11750	15290			
2300-0000		Radio Polonia, Warsaw	5995	6135	7125	7270	
2300-0000		Radio Sofia, Bulgaria	11660	15330			
2300-0000		Radio Thailand, Bangkok	9655	11905			
2300-0000		Radio Tonga, Tonga	5050				
2300-0000		SBC Radio One, Singapore	5010	5052	11940		
2300-0000		Superpower KUSW, Utah	15580				
2300-0000		Voice of America, Washington, DC	15290	17735	17820	18157	
			USB				
2300-0000		Voice of the UAE	6170	9595	11985	13605	
2300-0000		WHRI, Noblesville, Indiana	13760	17830			
2300-0000		WRNO, New Orleans, Louisiana	13720				
2315-2330		BBC, London, England*	11820	15390			
2330-0000	M-A	Radio Budapest, Hungary	6110	9520	9585	9835	
			11910	15160			
2330-0000		Radio Canada Int'l, Montreal	9955	15370	15440	17845	
2330-0000		Radio Kiev, Ukrainian SSR	11675	11790	11875	12000	
			13645	15180			
2330-0000		Radio Korea, Seoul, South Korea	15575				
2330-0000		Radio Tirana, Albania	9760v				
2330-0000		Voice of Vietnam, Hanoi	9840	15010			
2330-2355	M-A	BRT, Brussels, Belgium	9925				
2335-2345	M-A	Voice of Greece, Athens	9395	9420	11645		
2345-0000		BBC, London, England*	3915	6080	7180	9580	
2345-0000		Radio Berlin Int'l, Eaast Germany	6080	11890			
2348-0000		WINB, Red Lion, Pennsylvania	15145				

Send us your special QSLs and we'll copy and return them promptly, to be used as space permits (QSL editor, PO Box 98, Brasstown, NC 28902).

Lawrence Magne
Editor-in-Chief
Passport to World Band Radio

Sony's CRF-V21 Shortwave/Satellite Portable

At last! After some two years of peek and sneak previews, Sony has finally unveiled its long-awaited CRF-V21 portable.

$10,000 -- Antennas Included

This new model is even pricier than the ICOM IC-R9000 we reported on in last month's edition of *Monitoring Times* -- $6,500 in the United States, and even more in Europe. That includes a modular amplified antenna for everything but two of the four satellite channels, but it doesn't include the antenna necessary for reception of the remaining satellite channels. That antenna lists for $3,500.

This is the sort of expenditure that might give even Donald Trump second thoughts. Of course, for this kind of money you expect something special -- like the front half of a Mercedes, or Liberace's candelabra.

With the 'V21 what you get, instead, are shortwave and satellite reception, facsimile and RTTY capability, and enough high-tech features to warm the heart of Ziggy Stardust.

Facsimile Hints at World Band Video

Take that facsimile capability. First off, this isn't a telefax machine like you find in offices. Rather, it's a radiofax device that reproduces pictures, maps, charts and the like from off the airwaves.

Here's how it works. You tune in a fax signal on shortwave, or from satellite fax channels the 'V21 receives. You get the picture to come in properly by lining up the little vertical bars that appear on the face of a video display that comes built into the set.

Once this is done, the fax picture materializes on the screen. This takes time, and is not unlike a movie in which you watch a werewolf materialize from the crouched blob of a man. Once the completed fax picture has emerged, you can activate the print screen function, and

voila! The image is transferred from the video display onto a piece of paper.

How's that? Paper? Yes, paper. This one-of-a-kind radio has its own built-in thermal mini-printer. It produces toilet-paper-sized hard copy having incredible resolution -- nearly three times finer than that of a Hewlett-Packard Laserjet II computer printer. Even the fax paper is a class act -- a good step up from what's used on your everyday office fax machine.

This isn't really world band video -- pictures to go with, say, the BBC news. For now, you only can see specialized photos, weather charts and such. But it's obvious that world band video is now technically feasible. Its implementation may still be waiting in the wings, but the 'V21 at least gives you a peek under its kimono.

Unusual Features Include Spectrum Display

Aside from the fax, the 'V21's other high card is features -- from 350 channel memories that display station name to a World Time clock that displays seconds numerically. Like the ICOM IC-R9000, the 'V21's video display shows you station activity within given "slices" of the radio spectrum. With the ICOM, you can choose 50, 100 or 200 kHz widths. With the 'V21, the narrowest is 200 kHz.

This is a problem. 200 kHz is almost too wide for use within the shortwave spectrum -- the various signals are jammed so close together on the screen that they tend to blur together into an indistinguishable heap. At least with the ICOM you can go to 100 or even 50 kHz "slices," which are small enough for your eye to separate one signal from another.

Another thing is that the spectrum display is not so much like a moving picture as it is a series of snapshots of the spectrum. It's almost real time, but not quite.

Same Synchronous Detection as on ICF-2010

The 'V21 has a wealth of other features, but from the viewpoint of shortwave listening performance the most important is synchronous detection with selectable sideband. The same chip that's used on the Sony ICF-2010 portable is used in the 'V21, with -- no surprise here -- the same results.

Of course, this high-tech chip is a real plus. After all, it helps reduce adjacent-channel interference and fading distortion, and in so doing makes listening to world

band programs all that much more pleasurable. But you can say the same thing about the '2010, which is much cheaper. After all, you can get over a dozen '2010's for the price of one 'V21.

Performance Not Equal to Price Class

And this is the problem with the 'V21, feature-laden and sexy though it is. In nearly every respect, it performs only a bit better than the popular '2010. But the 'V21 doesn't even equal the shortwave performance of such tabletop models as the Japan Radio NRD-525 or Kenwood R-5000, which sell for around $1,000.

For example, if you're into ham or utility listening, the 'V21 is disappointing; its single automatic gain control decay rate is much too fast to "smooth out the bumps" in the single-sideband or CW modes.

As for listening to world band broadcasts, the wider bandwidth -- there are only two for shortwave listening -- is, at 7.3 kHz, somewhat wide. Too, its shape factor of 1:2.5 is pretty good, but it's below par for anything that lays claim to being a serious communications receiver.

Ergonomics and Software Not User Friendly

There are other problems with this set, too. The video display has poor contrast, which makes it hard to see. There is a swing-over light on top the set to help with this, but if you place it where it does any good, it blocks your view of the display. That light also looks like a handle. If you reach down and grab it to lift the set, the light is almost certain to break off.

Too, the software is not particularly user-friendly, and the ergonomics are generally mediocre. One exception is the 'V21's large rubber tuning knob -- this is, after all, the most-often-used control on a radio -- which is the best we've ever laid our hands on. Another is the keypad, which from both hardware and software perspectives is a pleasure to use.

The Bottom Line: Better Alternatives Available

What it comes down to is that the 'V21 is an awful lot of money for an upgraded '2010 with a fax machine and spectrum display. If you want a spectrum display, the 'R9000's works much better. If you want radiofax, others sell add-on fax devices for under $1,500.

mt

You can hear Larry Magne's equipment reviews the first Saturday of each month, plus Passport editors Don Jensen and Tony Jones the third Saturday, over Radio Canada's "SWL Digest." For North America, "SWL Digest" is heard at 8:10 PM ET on 5960 and kHz, with a repeat Tuesday at 8:30 AM ET on 9635, 11855 and 17820 kHz.

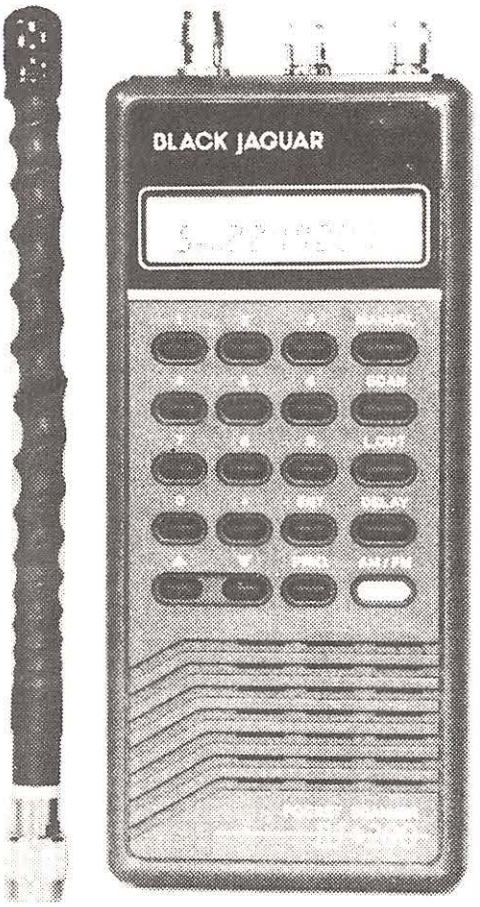
Passport's "RDI White Paper" equipment reports contain everything found during its exhaustive tests of communications receivers and advanced portables. These reports are now available in the US from Universal Shortwave and EEB; in Canada from PIF, C.P. 232,L.d.R., Laval PQ H7N 4Z9; and in Europe from Interbooks, 8 Abbot Street, Perth PH2 0EB, Scotland.

A catalog of these reports may be obtained by sending a self-addressed stamped envelope to International Broadcasting Services, Ltd., Box 300M, Penn's Park PA 18943 USA.

Bob Grove, WA4PYQ

P.O. Box 98
Brasstown, NC 28902

Black Jaguar 200



Occasionally an unusual radio surfaces on the market; the Black Jaguar model 200, manufactured in Tokyo by Palcom, is one of these. Designed for the foreign market, the Jaguar comes with an unusable European AC wall charger/adaptor, but does include internal nicad batteries, a soft carrying pouch with belt loop and earphone.

The frequency range is quite unconventional by American standards, but covers most of the UHF military aircraft band. A handheld unit the size of a Bearcat 200XLT, the Black Jaguar is advertised to cover 26-29.995, 60-88, 115-178, 210-260 and 410-520 MHz. We were able to program 17.57-29.995, 49-99.99, 106.6-184.995, 200-322, and 350-574.9875 MHz with signals receivable over most of those ranges.

Since the user can choose AM or FM mode on any frequency, the radio can be used on AM for shortwave, CB, and civilian and military aircraft. Narrowband FM is used on the remainder of the VHF/UHF bands. Since the Jaguar has no wideband FM, it cannot receive FM broadcasters or TV sound channels intelligibly.

While published sensitivity specifications are comparable with domestic scanners (0.5-0.7 microvolts FM, 1.0-1.5 microvolts AM), reception on our test unit was variable. Although high band signals (150 Mhz band) and military UHF (255.4 Mhz) were loud and clear, UHF base stations (450 MHz band) easily heard on a Bearcat 200XLT were virtually undetectable on the Jaguar.

Search step ranges are well chosen: 5 kHz up to 200 MHz and 10 or 12.5 kHz above. Unfortunately, there is no provision for search hold once a signal appears; delay can be used to hold the channel briefly after the transmission ceases, or the squelch can be adjusted to hear background noise during periods of inactivity until the signal reappears.

The search function is volatile--if the user switches briefly to another function, the search limits are erased and must totally reprogrammed to search again. Quite a number of internally-generated "birdies" were uncovered during the search routine.

A pushbutton tone control allows treble to be cut. We found that the unit is a bit bassy anyway, so it is unlikely that the tone control will be used. Audio from the 250 milliwatt amplifier is sufficiently loud but somewhat distorted, making listening a little fatiguing.

The whip antenna attaches to the radio by a TNC connector; a TNC/BNC adaptor is included for attachment to an external antenna. Functions include individual channel lockout and three-second delay, and 10-channel-per-second scan/search speed, 16 memory channels and channel 1 priority. The manual is well organized and easy to follow.

Since the Black Jaguar is not FCC certified in the United States, it is difficult to find dealers. Nonetheless, one *MT* advertiser, Electronic Equipment Bank, sells it for $259.95 plus shipping.

Scanners on the Near Horizon

Quite unexpectedly, AOR has announced the imminent arrival of their AR950 scanner, a compact mobile unit with excellent frequency coverage and 100 channels of memory. Bob Grove reviews this new release next month.

Also coming up for *MT* review are several new scanner models from Uniden who has repackaged the Regency Turboscan and Informant series, cancelled last year after Uniden purchased Regency.

The Turboscan has now supercharged its scan rate: 60-100 channels per second! The Informant series is factory preprogrammed to include public safety and other popular listening targets across the country; all the listener needs to do is turn it on.

The INF10 offers state-by-state scanning of police and weather channels; unwanted channels may be deleted to avoid annoying delays during the scan sequence. The IFN7 and INF 50 add other services as well.

All four of these little Uniden scanners are in the $200 range, making them pre-eminently affordable for the Christmas season! As always, *MT* will be the first to provide you with in-depth reviews of these and other products as soon as they become available.

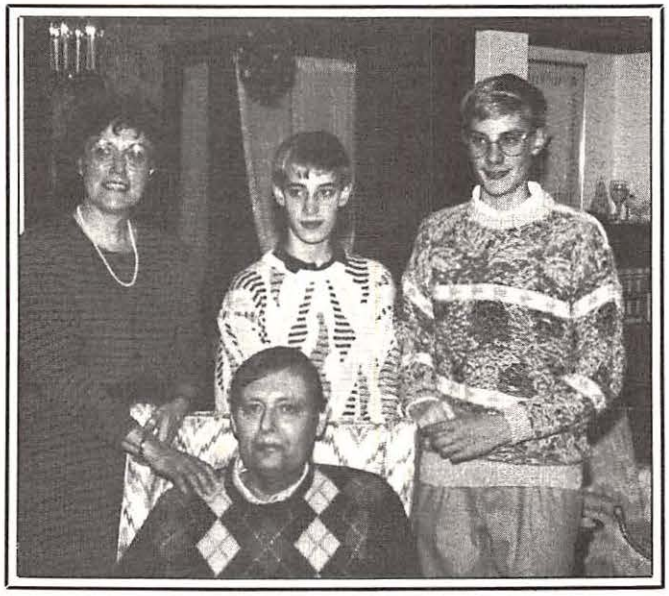
BOB HANSON
MAY WELL HAVE HAD 200,000 FRIENDS.
NOW HE NEEDS THEM ALL . . .

The world of communications has lost a great friend and devoted public servant. On Wednesday, May 8, 1989 Bob Hanson, W9AIF, passed away on the operating table during a delicate and enormously costly liver transplant operation.

Bob will be mourned by literally hundreds of thousands of individuals whose lives he touched throughout the world as a noted columnist . . . public service association executive (SCAN, REACT, Community Watch) . . . communications industry advertising and marketing manager . . . and active radio amateur.

But mourning alone cannot pay adequate tribute to Bob's total dedication to serving others—including his wife of 23 years, Marilyn, and two teenage sons, Peter and Andrew.

Since liver transplants are regarded by some as "experimental surgery," not one dime of the expense—estimated in excess of $200,000—was covered by insurance. We simply cannot allow Bob's wonderful family to live with that impossible burden.



Your help is desperately needed. Immediately. Please, please send your contribution today. Make checks payable to: **Organ Transplant Fund Inc./Robert Hanson** a legally constituted non-profit organization. Any funds collected in excess of those required to pay actual medical expenses will be used to relieve similar transplant victims.

The Robert Hanson Fund.
A Living Memorial.

Organ Transplant Fund Inc./Robert Hanson
P.O. Box 766 • Morris, IL 60450-0766

consumer electronics

Batteries: Radio Shack's Got Em

If you need a battery, Radio Shack will have it. That's what Tandy Corporation is now saying about their new program to offer consumers "hard-to-find" batteries for a wide array of electronics products through Radio Shack's Consumer Mail Center.

Radio Shack already stocks 97 battery types, one of the largest selections in the industry. According to Bob Miller, vice president of Radio Shack Consumer Merchandising, "This expanded program will let us supply almost any battery made."

A complete catalogue, available at participating stores, lists consumer batteries, batteries used by police and fire fighters, pagers, amateur radio operators, telephone battery packs used in cordless phones, and camcorder battery packs.

Radio Shack currently sells over 100 million batteries annually.

Tiny Tuner

It's a radio. It's advertising. It's Target tuning's new palm-sized radio -- that receives only one station. The market for Target Tuning's receivers is radio stations and radio station advertisers. Each side of the unit features a display area for the station's call letters or the advertiser's corporate logo. According to Tina Jacobs, executive vice president of the Moonachie, New Jersey, firm, stations like the little radios "because it boosts the number of listeners, while advertisers like it because it locks consumers into the station airing their commercials."

In two years, sponsors ranging from McDonald's to Miller beer and 150 FM stations have given away some 350,000 of the radios. Sales have been so successful, in fact, that according to the company, plans are under way for one-station mono and stereo AM, narrow-band FM and TV audio models as well.

Don't Sleep and Drive

You're driving along in the car, trying to squeeze the 1,500 mile trek from Philadelphia to Orlando into one sitting. As you hit Daytona Beach and your 18th hour, your eyes begin to sag.

Suddenly, you're awakened by the sound of screeching steel. You've fallen asleep at the wheel and the only thing that's between you and death is the guardrail scraping your passenger's side door at 65 miles an hour.

Such a scene would be all but impossible had you been using "Drive Alert." Fitting behind the ear, much like a hearing aid, Drive Alert emits a 2 kHz, 86 dB warning tone if the driver nods his head past a certain angle. That angle is selectable from among 18 positions.

Drive Alert is available from Softrade, a Claremont, California, firm and is just $19.95.

The Silencer

Now that you're awake, you'd better answer your car phone. It's ringing. What? You can't hear it because the stereo's on too loud? Then, along with your "Drive Alert," be sure to get "The Silencer." The Silencer automatically shuts off your stereo when your cellular mobile telephone begins to ring. Besides letting you know when the darned phone is going off, it'll also keep your friends and clients from learning about your bad taste in music. "The Silencer" is sold by Soundquest in North Chicago, Illinois for $40.00.

Free Tool Catalogue

You can get a copy of Jensen Tools' new catalogue simply by mentioning *Monitoring Times*.

The 160 page catalogue features a wide variety of tool kits ranging from everyday to the esoteric, including hand and power tools in English and metric sizes, test equipment, soldering/desoldering stations, static control and much more.

For your free copy write 7815 S. 46th Street, Phoenix, Arizona 85044. Be sure to mention *Monitoring Times*.

Thanks to Terry Calvert, Phoenixville, Pennsylvania; Jeffrey Logan of Washington, DC; Michael Scott Miller, Tennesen, California.

To have your new product or book considered for review in Monitoring Times, send it to Editor, 140 Dog Branch Road, Brasstown, NC 28902.

Fisher 1280X "Aquanaut" Metal/Treasure Detector

Not surprising, one name still seems to dominate the marketplace: Fisher. After all, it was Dr. Gerhard Fisher who invented and patented the first metal detector over half a century ago, giving rise to the famous SCR625 mine detector which saved so many foot soldiers during World War II. Dr. Fisher passed away last year, but the company he founded is going strong.

There are three fundamental types of metal detecting circuits: beat frequency oscillator (BFO), transmitter-receiver (TR or balanced inductance) and pulse induction. The BFO units, operating typically at near 500 kHz, are the least expensive and great for casual coin shooting in a public park, but they are considered quite primitive among advanced hobbyists.

Pulse induction instruments rapidly switch their transmitters on and off, listening for residual signals from temporarily excited ("charged") metallic objects, especially iron.

For serious applications, especially near salt water or deeper in the ground, nothing beats a good, low frequency, inductive balance machine and, judging from the literature, the Fisher 1280X, which operates at 2.4 kHz (voice frequency -- "VF"), looked like a good one.

Let's Try It Out

The 1280X Aquanaut comes in a custom molded carrying case and includes headphones, batteries and a five-year warranty! The accompanying owner's manual is easy to read, well illustrated and loaded with operational hints for the newcomer.

The entire unit, headphones and all, is saltwater-resistant and submersible to 250 feet. A high-intensity LED indicator lamp flashes brilliantly in the presence of metal, particularly useful at murky depths, but visible in sunlight as well.

Removing the instrument from its cozy cabinet, I attached the search head, gripped the handle, rested my forearm in the padded cradle and prepared for action. For even lighter, anti-fatigue operation, the control box conveniently dismounts and may be worn on a belt clip (provided).

Although a set of eight inexpensive AA batteries will operate the instrument for about 40 hours, I would recommend premium alkaline cells -- why risk early battery exhaustion when untold wealth awaits discovery beneath your feet?

Switching the instrument on, I was pleased to see that there were no critical adjustments to be made, just simple controls for volume, sensitivity and discrimination. The discriminator control is especially useful for rejecting unwanted signals from trash, making searching for valuables even easier and more productive.

With headphones clamped to my ears (they can also be left loosely dangling around the neck) I began the classical sweeping motion over the ground. Almost immediately the headphones beeped, alerting me to metal at my feet. Desoto's buried treasure? Civil War artifacts? Abandoned coin cache? Lost jewelry?

Nope. A nail. But it was a start! Next, I threw a penny down into the grass (pretending not to notice where it landed) and swept once more. "Beep" -- I scored again. My finger ring was also decidedly pinpointed by the unerring instrument.

Switching on the discriminator circuitry, I swept the coil low and evenly across the ground. While sensitivity was still excellent for the penny and gold ring, there was no sign of the nail! That is the beauty of a fine instrument like the Fisher 1280X -- the ability to discriminate between trash and treasure.

Further tests showed that the settings did not drift; they remained rock-stable due to the quartz reference oscillator and sturdy construction of the search coil. Just as important, no false indications were heard when dragging the search head through wet grass or close to moist soil.

Small metallic targets like the ring and coins were detectable to several inches, while large masses sounded the alarm at several feet. As the discriminator knob is advanced higher and higher, more and more trash is rejected including nails and pull tabs from beverage cans, traditional sources of endless irritation among beachcombers and artifact collectors.

Being a motion detector, the signal stops if the search head is not moving, but only a tiny movement is necessary to register a target. This is no disadvantage as the operator will be moving the search head back and forth anyway as he zeroes in on his target.

It was time for a field test. I decided to start with a school playground. As I swept the 1280's search head across the soil at the bottom of the slide, the tone registered loud and clear. A pull tab from a beverage can! -- time to use the discriminator mode. No more pull tabs were going to foil this instrument!

Another sweep and a clear registration from the detector sounded. Using a digging tool made from a large screwdriver, I anxiously scraped away an inch or so of soil. A dime!

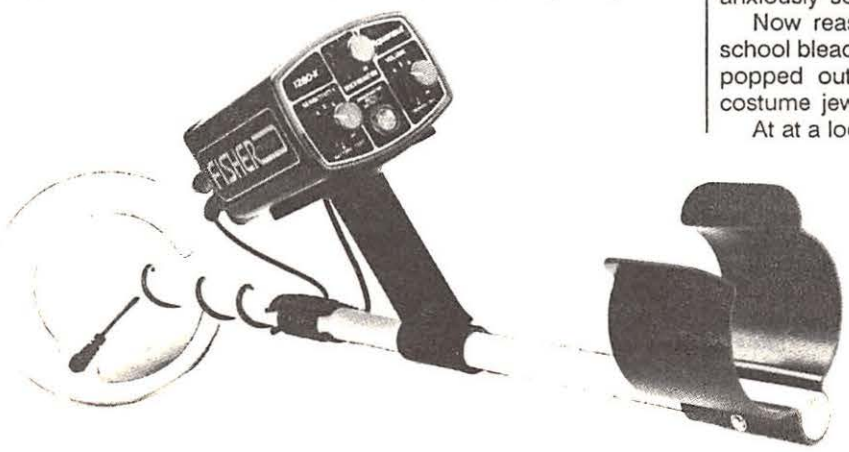
Now reassured and with adrenalin pumping, under the high school bleachers and out to the beach I went. More loose change popped out of the ground as I swept and dug. Even some costume jewelry.

At at a local flea market I chanced to start a casual conversation with a Cherokee Indian. "If you ever get hold of a good metal detector" he confided, "I'll take you to a good spot." "What's there?" I asked. "Rebel stuff," he whispered.

I don't know what the rest of Brasstown will be doing this weekend, but I know where I will be, and what I'll be taking with me!

(1280X Aquanaut, $649.95 plus shipping from Fisher Research Laboratory, Dept. MT, 1005 I St., Los Banos, CA 93635)

Bob Grove, WA4PYQ



Doug DeMaw
P.O. Box 98
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Choosing the Right Capacitor

Have you been confused about selecting the correct capacitor for a particular application? If so, you aren't alone in your moments of indecision! As the state of the art advances, we find new types of capacitors listed in our catalogs each year.

Gone are the days when the tubular paper capacitor, large mica capacitors, and electrolytic capacitors were all that we had to work with. Things aren't quite so simple for a nontechnical person these days! Let's examine some of the more common capacitors we must work with.

Disc Ceramics

It isn't necessary to use special capacitors in most audio circuits, but when we deal with RF (radio frequency) circuits, the matter becomes one of concern, respective to using effective capacitors.

The disc ceramic unit is generally the best choice for bypassing and coupling circuits at RF. Why is the disc ceramic so good? It is because it has minimum unwanted inductance along with the desired capacitance.

Unwanted inductance (X_L, or inductive reactance) is caused by the pigtail leads on the capacitor. There can also be some internal X_L, depending upon how the component is made. If we were to short-circuit the capacitor leads we would find that the leads and the capacitor formed a tuned circuit at some frequency. This can be checked with a dip oscillator.

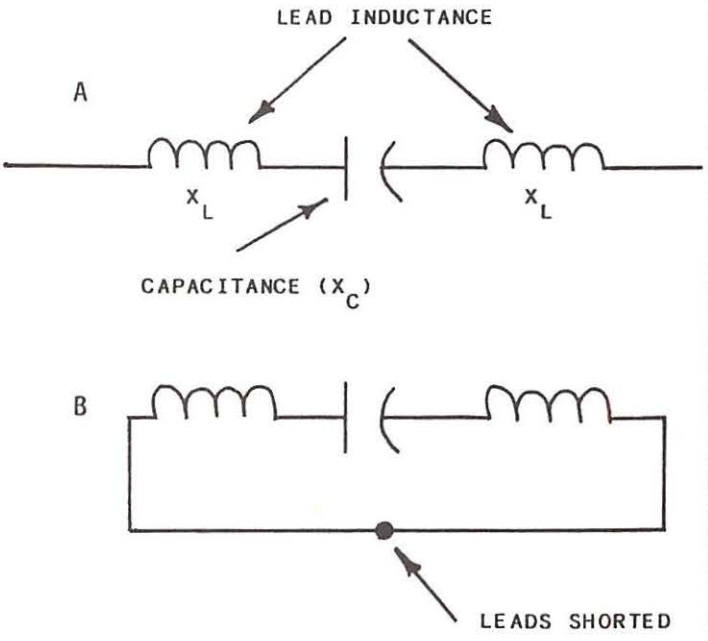

Figure 1 -- Illustration A shows the effects of unwanted lead and internal inductance in a capacitor. In effect, we have a capacitor in series with two coils. The PC-board elements or other wiring associated with the installed capacitor add to the unwanted inductance (X_L). Example B shows that if the capacitor leads are shorted together, we have a tuned circuit formed by the capacitor and the stray inductance (see text).

But, disc ceramics have the least unwanted or parasitic inductance of the many types available. The notable exception is the monolithic chip capacitor. It has no leads. It is soldered directly to the PC-board pads by means of metalized end strips on the capacitor body. Chip capacitors are used mainly at VHF and UHF, where stray inductance can't be tolerated.

The common disc ceramic is suitable for use from DC into the lower VHF spectrum. The important consideration is to keep the leads as short as practicable when you solder them into your circuit.

The unwanted X_L tends to negate the effectiveness of the capacitor, especially as the operating frequency is increased. The stray inductance is in series with the capacitance (see Figure 1) and this ruins the function of the capacitor.

In a severe case it is as though the capacitor was not there at all, especially in a bypass application. Ineffective bypassing can cause a circuit to self-oscillate and become unstable. If the emitter of a bipolar transistor or the source of a FET amplifier is poorly bypassed (owing to excessive X_L), the stage will have low gain. This is caused by what is known as degenerative feedback. Therefore, it is wise to keep the capacitor leads as short as you can make them.

A similar event occurs when there is excessive stray inductance in a coupling circuit between amplifier stages (blocking capacitor). If the X_L is too great, it will be difficult for the RF signal to pass through the capacitor from one amplifier stage to the next. Again, keep those leads short.

Large mylar and polyester capacitors are not suitable in RF circuits. They have considerable internal inductance along with that caused by the pigtails. They are fine for audio and DC circuits where stray inductance is too minimal to worry about.

Silver-Mica Capacitors

There are two kinds of silver-mica capacitor. One is the older style that has a square or rectangular molded-plastic case. The case has a red color.

The units that have brown cases are not silver-mica. They are also mica capacitors, but aren't as temperature-stable as the silver-mica ones.

Modern silver-micas are called "dipped" silver-micas. The outer insulation is brown in color and they are much smaller than the older units. The capacitance value is printed on the case, whereas the old silver-micas used a color code of dots to signify the value.

Most silver-mica capacitors perform well into the lower VHF region if the leads are kept short. They are slightly more inductive than are disc ceramics, but they may be used for coupling and bypassing.

The internal capacitor plates are coated with silver in order to improve the conductivity of the plates. This helps them to work more effectively at the higher frequencies. The silver increases the capacitor Q (quality factor), and this is important if a tuned circuit requires high Q.

An example of this principle is when we use a high-Q slug-tuned coil with a fixed-value capacitor in parallel or in series with the coil. A capacitor with low Q can negate the high Q of the coil. This results in a broadly resonant tuned circuit, whereas we may require a narrow response in order to reject RF energy from frequencies above and below the desired frequency.

Stable Capacitors

The ability of a capacitor to maintain its manufactured value in an environment of changing temperature is vital in oscillator circuits. Capacitance changes cause frequency drift. This is especially annoying in a receiver or transmitter tuned oscillator.

Perhaps the best capacitor you can use in an oscillator or tuned filter is the NP0 (last digit is a zero) disc ceramic. These capacitors cost slightly more than conventional disc ceramics, but they stay put very nicely as the ambient temperature around them, plus any internal heating caused by RF current, varies. I use them in all of my VFO (variable frequency oscillator) circuits. I use them also in high-order crystal overtone oscillators, where frequency drift can, and does, occur.

Your second option is to use polystyrene capacitors if you can't locate any NPO capacitors. The polystyrene capacitor is entirely acceptable up to approximately 30 MHz in an oscillator circuit. They are nearly as temperature-stable as NPO ceramics. They are, however, somewhat more inductive (X_L again!), so it's important to keep those capacitor pigtails as short as you can.

My experience has proven that they are less prone to capacitance change than are disc ceramics, respective to internal heating from RF currents. This is because they have greater capacitor-plate area within them.

Silver-micas may also be used in oscillators, but they are rather unpredicable in terms of stability. Some will exhibit positive drift (increased capacitance) while others from the same manufacturer's batch will show negative drift (decreased capacitance).

If you have several silver-micas of the desired value, keep substituting them in your circuit until you find a group of capacitors that provide stable oscillator operation. This cut-and-try method is tedious, but it pays off.

Stable, high-Q capacitors are needed also in audio filters. Polystyrene is an excellent choice in this application, but mylar capacitors are acceptable also. Silver-micas could be used in audio filters, but they do not generally have high enough capacitance values for audio work.

Capacitor Voltage Ratings

Be cautious when ordering your capacitors. The voltage rating is important if the capacitor is to survive in your project. The miniature 50- or 100-volt DC capacitors are fine for circuits that operate from 12 or 24 volts DC. They occupy far less room on a PC board than do the larger 600-volt types.

Always allow a safety margin of twice the circuit operating voltage when dealing with DC. For AC applications, such as the bypassing of the 120-volt AC line, you must take into account the peak-to-peak AC voltage. In other words, 120 volts RMS (root mean square) is what you take from the wall outlet. The peak-to-peak value of this voltage is 2.828 times the RMS value.

Hence, the capacitor you use across the AC line must be able to accommodate 547.66 volts in order to not be damaged. A capacitor with a 600-volt rating may last indefinitely in this application, but it is marginal at best. Play it safe by installing a capacitor with a 1000-volt or greater rating.

Electrolytic and Tantalum Capacitors

There are many kinds of high-capacitance units to choose from. All of them are fine for use in power-supply filters and in decoupling circuits that require a low impedance voltage-supply line.

However, in those applications where minimum X_L is necessary, you will be wise to install tantalum capacitors. They are compact devices that have minimal internal inductance. In fact, they work well as coupling and bypass capacitors in RF circuits up to approximately 10 MHz or so. The small size of tantalum capacitors makes them ideal for use in compact PC-board modules.

The only limitation I can think of is their relatively low voltage rating. They are intended primarily for circuits that have an operating voltage of 28 or less, DC. Most suppliers do not list tantalums that have maximum surge-voltage ratings in excess of 35.

Some Final Thoughts

Try in all instances to avoid unwanted X_L. At the higher frequencies it is not uncommon for, say, a 100-pF disc capacitor to exhibit a capacitance of 30 or 40 pF. This is because the X_L that is present cancels part of the effective capacitance of the component. The longer the capacitor leads, the worse the situation.

Always be mindful of the voltage rating of the capacitor you use. Allow plenty of leeway in the rating in order to prevent damage to the capacitor.

Don't rely on the marked value of your capacitors if they are to be used in critical circuits. Check them with a calibrated digital capacitance meter. I have found many disc ceramics that were not close to having the marked value.

For example, a batch of 0.001 uF capacitors I recently bought showed capacitances between 680 and 830 pF. In other situations, I have bought capacitors that had values well above the marked amount (0.02 uF units that ranged from 0.28 to 0.31 uF!). I have observed, however, that most silver-mica and polystyrene capacitors are very close in value to that which is marked on them. Likewise for NPO disc ceramics.

mt

Rich Arland, K7YHA

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Converting a Heath Transceiver

Why spring the extra bucks to assemble an HW-9 with the band expansion when you can expand the HW-8 you already own?!

This month's column centers around the conversion of one of Heath's most popular HF transceivers, the HW-8, to work on 160, 30, 17, & 12 meters. This tiny QRP (low power) transceiver has been one of the most highly successful radios that ever came out of Benton Harbor and more modifications have been done to this rig than any other radio produced by Heath.

As originally designed, the HW-8 covers the 80/40/20/15 meter ham bands. It features a direct conversion (DC) receiver (the RF signal is converted directly to audio in the first mixer stage), about 2 watts output on the bands and semi-break-in CW keying. This is a CW-only transceiver and can be picked up at ham fests for between 50 and 85 dollars depending upon condition and modifications.

The conversions described here originally came from the G-QRP Club's quarterly magazine, *SPRAT*. Bob Fowler, G3IQF was the author of these mods and has done a fine job of documenting the conversions. These conversions can be done one band at a time or all at once. 160 meters will replace the 80 meter band, 30 meters will replace the 40 meter band, 17 meters will replace the 20 meter band, and finally 12 meters will replace the 15 meter band.

All four of the HFO crystals (Y1-4) will have to be replaced to move the frequencies of operation to the desired bands. When ordering new crystals, specify 30pf load capacitance and an HC6-U holder. You will need the Heath assembly manual for these mods.

Replacement capacitors can be polystyrene or silver mica. In addition, the QRP ARCI offers a book titled *The Hot Water Handbook* by Mike Bryce/WB8VGE (225 Mayflower N.W., Massillion, OH 44646) which will be indispensable.

It will be best to completely disassemble the rig down to the bare circuit board so access to the toroidial inductors and other parts can be realized. If you are inexperienced at performing equipment modifications, PLEASE contact your local amateur radio club and find someone who will assist you. Take your time and work slowly. Solder carefully, and enjoy the trip!

160 Meters

One of my favorite bands always has been 160 meters. It is a very good QRP band when the static and noise are at a minimum during the winter months. So, let's start with the 160 meter mods.

1. Replace Y1 (12.395 MHz) with a crystal cut for 10.695 MHz (this puts the band edge at "10" on the tuning dial.
2. Replace C116 with a 150pf cap.
3. C64: add a 400pf in parallel on foil side of PCB.
4. Replace C1 with a 560pf cap.
5. Replace C15 with a 330pf cap.
6. C78: add a 330pf in parallel on foil side of PCB.
7. L22: remove all turns on the toroid and rewind with 34 turns of #32 gauge wire and add a 230pf capacitor in parallel with L22 on the foil side of the PCB.
8. Replace C94 with a 470pf cap.
9. C96: add 470pf in parallel on foil side of PCB.
10. C97: add 680pf in parallel on foil side of PCB.
11. C303: add 220pf in parallel which is switched in when 160 meter bandswitch position is depressed (a. connect one end of the 220pf cap to C303/R304 junction. b. Connect the other end to pin 14 of the bandswitch. c. Jumper a short lead between pins 11 & 15 of the bandswitch.
12. For maximum performance in the CW segment of the band, set the tuning dial to 40 (1.840MHz) and allow the set to warm up for 30 minutes. Realign the 160 meter circuits following the 3.5 MHz instructions in the Heath manual. Transmitter output power is about 2 watts.

30 Meters

30 meters is a great QRP band. Propagation is much like 40 meters and this band will be "open" round the clock.

1. Replace Y2 (15.895 MHz) with a new crystal cut for 18.895 MHz (this puts the band edge at the "100" mark on the tuning dial).
2. Replace C118 with a 100pf cap.
3. Replace C66 with a 68pf cap.
4. Replace C4 with a 27pf cap.
5. Remove C18.
6. Replace C81 with a 150pf cap.
7. Replace C82 with a 150pf cap.
8. L23: remove two turns (one from each end of the toroidal inductor.
9. Remove C98
10. Replace C101 with a 80pf cap.
11. Replace C102 with a 270pf cap.
12. L28 & L29: remove 8 turns from both inductors (4 turns from each end and respace remaining turns evenly around the toroidal form).
13. Set main tuning dial to "125" (10.1256 MHz) and allow the HW-8 to warm up for 30 minutes. Realign the 30 meter circuits (except VFO) following the 7MHz instructions in the Heath manual. Transmitter output is about 2.2 watts.

17 Meters

The newest and extremely interesting 17 meter band provides excellent QRP DX throughout the hours of daylight and well

Monitoring Times invites you to submit your favorite projects for publication. For more information, contact Rich Arland, 25 Amherst, Wilkes-Barre, PA 18702

into dark most days.

1. Replace Y3 (22.895 MHz) with a crystal cut for 26.895 MHz (this puts the band edge at "68" on the dial.
2. Replace C121 with a 33pf cap.
3. Replace C68 with a 68pf cap.
4. C7: add a 22pf cap across foil side of the PCB.
5. Replace C84 with a 68pf cap.
6. Replace C85 with a 68pf cap.
7. L24: remove 2 turns (one from each end of the toroidal coil).
8. Replace C105 with a 180pf cap.
9. L31 &: L32: remove 8 turns each inductor (4 turns from each end, respace the turns evenly around each toroidal coil form).
10. For maximum performance in the CW segment of the band, set the main tuning dial to "100" (18.100 MHz) and allow the rig to warm up for about 30 minutes. Realign all 17 meter circuits using the 14 MHz instructions in the Heath manual. Transmitter power output is about 1.3 watts.

12 Meters

Finally we'll convert 15 meters to 12 meters. 12 meters is similar im many respects to 10 meters and during this period of high sunspot activity will provide the QRPer with lots of fun working stations all over the earth.

1. Replace Y4 (29.895 MHz) with a crystal cut for 33.695 MHz. This puts the band edge at "90" on the tuning dial.
2. Replace C123 with a 15pf cap.
3. Replace C71 with a 33pf cap.
4. Replace C87 with a 33pf cap.
5. Replace C88 with a 33pf cap.
6. L25: remove 3 turns (1 from one end and two from the other end of the toroidal inductor and respace turns evenly around the form).
7. Replace C107 with a 75pf cap.
8. Replace C108 with a 100pf cap.
9. L33 & L34: as L25 above.
10. For maximum performance in the CW segment of the band, set the main tuning dial to "110" 24.190 MHz) and allow the set to warm up for about 30 minutes. Realign the 12 meter circuits following the 21 MHz instructions in the Heath manual. Transmitter power output is about 700mw.

Additional modifications that will prove useful and enhance performance are: replacement of Q1 (MPF 105) with a dual gate MoSFET (40673 or 3N211). This will really make the receiver section perk up.

Addition of an S-meter (*Hot Water Handbook* available through WB8VGE) will give you the feel of a "big" rig. Several AF filter mods are also presented in the *Hot Water Handbook*, which will definitely improve the receiver's audio section.

I would like to express my appreciation to the Rev. George Dobbs, G3RJV of the G-QRP Club who has graciously given his permission to reprint these modifications, and to Bob Fowler, G3IQF, for doing the pioneering effort on the mods.

Till next month 73
Rich, K7YHA

mt

If you do not already possess the HW-8 assembly manual, it is available from Heath Company, P.O. Box 8589, Benton Harber, MI 49022-8589 (1-800-253-0570). Or we will send you the pertinent schematic if you will send your request to P.O. Box 98, Brasstown, NC 28902 and enclose an SASE.

W. Clem Small, KR6A, CET

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The Short-Wire Antenna: *or*
How to Listen to the World with an Ice Pick!

I remember that, when I was a kid, I saw an intriguing ad for a McMurdo Silver shortwave receiver. Although you don't hear anything about them these days, McMurdo Silver receivers had a reputation for quality performance.

The ad which I saw had a picture of the receiver with an ice pick attached to the antenna terminal and a caption which read something to the effect that, "This receiver can receive signals from halfway around the world using only an ice pick for an antenna!" I was impressed.

Of course, we know that an ice pick is not much of a shortwave antenna, and certainly not one to be recommended for any serious radio work! But the point to be made here is that it is possible to use a very short antenna on the shortwave bands and still get reception of some kind on the stronger signals. And, if you make the ice pick longer, say 5, 10, or 20 or more feet long, then the number of signals which you can receive becomes much larger.

Of course, we don't have 20 foot, or even five foot long ice picks, so we usually use wires for such antennas. And it is remarkable what we can do with these short-wires at times.

Everything has its place

But don't think for a moment that short-wires are a preferred type of antenna for the shortwave bands. At VHF and higher frequencies, such short lengths of wire can be used to make excellent antennas with good amounts of gain. But on the HF (shortwave) bands these lengths are not considered desirable for most communications work.

On the other hand, short-wires do have their place in the world of antennas, and sometimes fill a need quite adequately. Ask any old-timer, and you'll likely find that they have experienced a number of occasions where a short-wire antenna came in handy.

As just one example, when I was in college, I lived in a rented basement room with no privileges of putting up an outside antenna. I put up a short-wire antenna about 15 feet long on the ceiling of my room (that's just under the floor of the house) and was able to get in on all the local 80-meter rag-chewing using a little rig of only about 15 watts input. Yep, that means that I used the short-wire for transmitting as well as for receiving.

Short-wire antennas can be useful in receiving situations where the level of the signals you want to receive is fairly strong. Why put up a larger antenna if you don't need it? They are also useful in receiving situations where you don't have the space or the resources to put up a long-wire antenna. You will not be able to receive the less-strong signals that you might get with a longer wire, but still there are usually a number of interesting signals to be heard with a short-wire.

Of course, hams want to be able to transmit as well as receive, and the same general comments apply to their situation: the number of stations they can hear and work is going to be less with a short-wire antenna than with longer wires, but a lot of amateur radio enjoyment has been had over the years with short-wire antennas.

A word on antenna tuners

If you use a short-wire antenna only for receiving, you do not have to use an antenna tuner. Connecting the antenna wire directly to the antenna terminal of your receiver is fine in most instances.

Much of the time a tuner is not really helpful in receiving anyhow, although a tuner will "peak" the signals, and make them sound louder. You can usually get the same effect by turning up your volume control. But on really weak signals you can occasionally help things a bit with a tuner, and a good portion of the signals on a short-wire antenna are weak.

Also, tuners do give a bit of selectivity which can help fight intermodulation distortion if you have a problem with that. So, if you have an antenna tuner, try it with your short-wire, and see if it helps your receiving situation.

On the other hand, if you are also going to transmit with the short-wire, you must use an antenna tuner or matching system of some kind; otherwise you are not likely to radiate much of the RF your transmitter generates. If your transmitter has a built-in antenna matching system, that may be enough. Otherwise, use an antenna tuner.

Let's make an antenna!

The short-wire antenna is one of the

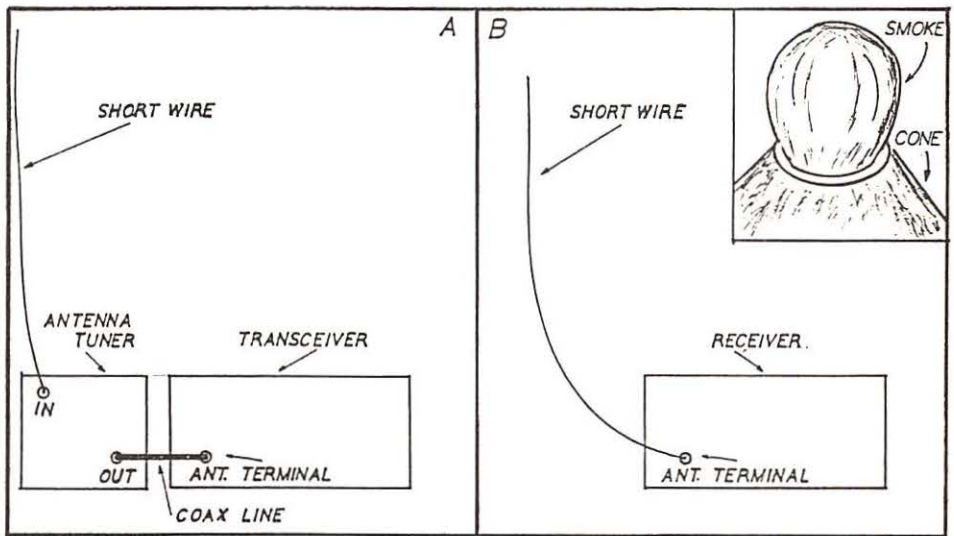


FIG. 1. SHORT WIRE ANTENNA WITH ANTENNA-TUNER (A), AND WITHOUT TUNER (B). INSET SHOWS VOLCANO SMOKE ANTENNA.

easier antennas to build. First decide what space you have available which is appropriate for mounting an antenna. Along the wall, on the ceiling, in the attic, and under the rug are places that have worked for many people.

Mount it as high as is practical or desirable. Make sure that the antenna is not touching any metal objects. You may use any size wire that is convenient, insulated or uninsulated. Just lay, tape, tack, tie, or otherwise put the antenna in place, and hook it up as shown in Figure 1. *Be sure to make the antenna as long as possible in the space you have available.*

If you find that your antenna will not work mounted indoors, you may have too much metal in the construction of the building where you operate your rig. In such cases, a metal flag pole mounted out on a window sill or a wire dropped out a window may work okay.

If you use the antenna for transmitting, you should probably use end insulators and keep the wire clear of its surroundings. Also, remember that transmitter RF can "bite," so don't leave the antenna where it can be touched by unsuspecting children or adults.

Of course, you should use only low-power transmitting levels on indoor antennas. The corona discharge often found with higher powers could put sparks where you don't want them. With indoor antennas, you and your family are going to be close to the radiating antenna. Since we don't yet know just what long-term health effects accrue from living in an RF field, this is another reason to use only low power with indoor antennas.

AND SO: If you have a situation where a longer antenna is not possible, or not necessary, you may find that a short-wire antenna is just what you need. And, although chances are that you will not "work the world with an ice pick," a lot of good communications have been had with short-wires in the past. Why not give one a try?

RADIO RIDDLES

Last Month: I asked, "What is a 'volcano smoke' antenna, and how does an antenna get such a name?"

Picture the quarterwave groundplane antenna with its vertical element shaped like a balloon, and its groundplane shaped like an upside-down cone or volcano peak, as shown in the inset in Figure 1B.

Electrically this antenna is similar to the groundplane antenna, although its "fatter" dimensions give it a greater bandwidth. Its name, obviously, springs from its physical resemblance to a volcano spouting smoke.

This month: The design of the volcano smoke antenna is sometimes seen as derivable from the quarterwave groundplane antenna. The same can be said of the discone antenna, covered in last month's column. Where did we get such a useful design as the groundplane antenna, anyhow?

Find the answer to this month's riddle, and much more, next month in your copy of *Monitoring Times*. Til then, Peace, DX, and 73.

mt

ask bob

Bob Grove, WA4PYQ

P.O. Box 98
Brasstown, NC 28902

Q. I have seen advertisements in MT for an 810-912 MHz converter which connects to any scanner with 410-512 MHz coverage. How well does this work and what will I hear? (Robert Randall, Ridge Spring, SC)

A. A converter has circuitry just like the "head end" of a receiver; it picks up a signal, amplifies it and mixes it with an oscillator frequency to shift the frequency lower where it is easier to process. A well-designed converter works quite satisfactorily to extend the frequency range of any receiver.

The frequency block 806-960 MHz is similar in allocation to VHF high band (150.8-174 MHz) and UHF land mobile (406-512 MHz). The same services -- public safety, government, amateur, mobile phone, paging, business and industrial -- are found in both, although there are some differences in technologies.

For example, trunking and cellular communications are only found in the 800 MHz band which is used in metropolitan areas where conventional VHF and UHF channels are already saturated.

Q. How can I eliminate "ghosting" on my TV picture? (Reijo Siivonen, Rauma, Finland)

A. TV ghosting may be produced in any of three ways: multiple reflections from nearby obstacles (buildings, mountains, metal siding or ducting); direct pickup of the signal by unshielded downlead (like 300 ohm twinlead); or poor installation (loosely attached crimp rings on F connectors, unterminated outputs on splitters).

To minimize reflections, use high gain directional antennas with excellent front-to-back ratio, and mount them as far as possible from large metallic surfaces. The antenna should be rotated, observing the picture for minimum ghosting.

To avoid pickup by the downlead, use well-shielded coaxial cable, matched with balun transformers at the antenna (and at the TV set if an F connector is not provided).

Q. What frequency is used by Chicago school security personnel? (Thomas Sullivan, Chicago, IL)

A. The Chicago Board of Education is licensed on many frequencies including 152.480, 462.675 (GMRS), 465.000, 466.050, 471.6625 and 474.6625 MHz.

Do the security guards wear shoulder patches or other uniform labels identifying a commercial security company ("rent-a-cop")? If so, their frequencies can be most anywhere in the business bands, VHF or UHF.

To learn their operating frequencies, simply look up their company name in your local FCC office. They have visiting hours for such private file searches on their microfiche.

Some resourceful scanner enthusiasts invent clever ploys like carrying a hand-held frequency counter up to a handie-talkie-bearing individual and asking, "Do you know how this works? Push your mike button and I'll show you"!

Q. On an old receiver I see a switch marked "AVC" and "MVC". What do these mean? (Kevin Neal, Flippin, AR)

A. They mean "automatic volume control" and "manual volume control," respectively. AVC automatically compensates for wide differences in received signal strengths to accommodate the weakest signals, yet prevent the receiver from overloading or "blasting" on strong signals. MVC requires the operator to adjust the sensitivity (or RF gain) control to compensate for the differences.

Strictly speaking, this level-compensating circuitry doesn't really adjust the volume (audio); it varies the gain (sensitivity) of the signal amplification stages. For this reason, manufacturers prefer to call AVC "AGC."

Q. Where can I find a type 3HA5 tube for my TV tuner? (Gary Hickerson, Ft. Smith, AR)

A. There are many specialists who sell old vacuum tubes. The largest is Richardson Electronics, 3030 North River Rd., Franklin Park, IL 60131. Dozens of smaller collectors list their services in the Antique Radio Classified; send $2 for a sample to John V. Terrey, PO Box 2, Carlisle, PA 01741.

Some others include Don Diers ($1 catalog; 4276-AB1, N. 50th SWt., Milwaukee, WI 53216-1313); Richard Dreher ($1 for list; PO Box 691443, Tulsa, OK 74169); Steinmetz Electronics (SASE for list; 7519 Maplewood Ave., Hammond, IN 46324); Old Tyme Radio (2445 Lyttonsville Rd., Silver Spring, MD 20910); and Unity Electronics (Elizabeth Industrial Park, 107 Trumbull St., Elizabeth, NJ 07206).

Q. Why do international broadcast stations insist on using the term "meter band" when they announce their frequencies? Is it important for me to know? (Helen Wilkerson, Greenville, SC)

A. Absolutely not. Early radios did not have accurate tuning, so approximate wavelength references were close enough. This habit persists among the world broadcasters, and many radios used in third-world countries still have the meter-band legends on their dials.

Many major broadcasters (Radio Moscow, BBC, etc.) have so many transmitters operating simultaneously, even in the same band of frequencies, that a reference of which band they may be found in is usually enough information for listeners to snag at least one clear frequency.

Q. I have no trouble understanding hams on my scanner, but on shortwave near 7 and 11 MHz they sound all garbled. Do I need a better antenna? (Joseph Johnson, Savannah, GA)

A. Sounds more like you need a better receiver. On your scanner, no tuning is required; on shortwave, where hams use single sideband, fine tuning is required and a good BFO or product detector is mandatory.

Q. My Uniden Madison CB now gives me audio feedback when I press the transmit button on my newly wired "Echo Master Plus" power mike. Any suggestions? (Gene Capenegro, Bradley Beach, NJ)

A. Sounds as though either the speaker is not being switched out by the contacts on the mike when you press the key or, if it derives "echo" feedback from the speaker circuit, it might have too much feedback.

Try disconnecting one speaker wire as an experiment when you make a transmission; do you have good modulation? If so, then the mike wiring is at fault.

There is another possibility if you are using an illegal linear amplifier. RF feedback from standing waves will manifest itself in the manner which you describe.

Q. Why is it that when I listen to the BBC on 9590 kHz, then switch to 9915 kHz, there is a 2.3 second delay in the program material? (Viorel Lupsa, Seattle, WA)

A. While different signal paths, and even satellite relays, can provide some delay, they are fractional seconds, not several seconds, in duration. Most likely, the taped program simply started 2.3 seconds later at one transmitter site.

Q. Can I order a foreign version of a Bearcat scanner to cover the 60-88 MHz range as used in Europe?

A. Not from Uniden America since such scanners are not FCC certified for domestic sales. For additional information you may wish to contact Uniden Europe SA Brussels, Leuvensesteenweg 321, 1940 Sint-Stevens Wolvivel-Zauentem, Belgium.

Q. I bought a scanner that offered 225-400 MHz AM coverage to hear military aircraft, but can't seem to find any active frequencies. Any suggestions? (Joseph Short, Canby, OR)

A. There is nowhere in the country that doesn't have some receivable activity at some time during the day or night in the 225-400 MHz military aircraft band. Since these are training missions, activity will vary with command scheduling.

Try loading the following frequencies into memory and use an antenna which is designed for reception in that range. Many multiband scanner antennas are virtually worthless on those frequencies.

236.6 USAF control towers; 241.0 National Guard; 243.0 distress/calling; 255.4 flight service/weather; 257.8 aircraft to FAA towers; 272.7 flight service/weather; 311.0 SAC refueling; 321.0 SAC refueling; 381.8 US Coast Guard; 372.2 USAF dispatch. There are many more in use nationwide, but this should give you a start.

Q. Where can I get a custom leather case made for my Sony ICF2003 portable receiver? Felipe Rogas, Norcross, GA)

A. To our knowledge, no one is specializing in custom leather cases on single orders. You should contact a local leather craftsman. For stock leather cases for hand-held radios, contact Leathersmith Products, Rt. 2, Box 2271, Bethel PA 19507 (phone 1-800-233-0440); or Bee Electronics, 2655 Gardner Rd., Broadview, IL 60153 (phone 1-800-336-3115).

Q. As a newcomer to short-wave listening, I am puzzled as to why so many stations are bunched on top of one another at one place on the dial when there are so many vacant spaces above and below? (Helen Wilkerson, Greenville, SC)

A. This is an excellent question. By international agreement, various users (broadcasters, hams, aircraft, ships, etc.) are allocated specific swaths (bands) of frequencies in the radio spectrum. As technologies change, so does relative occupancy of the spectrum.

When the allocations were first made decades ago, transmitters were not spectrum-efficient. Now single-sideband voice and radioteletype have narrowed the amount of spectrum necessary to conduct communications; many users have gone to satellites, freeing up even more spectrum.

The broadcasters remain as the only wide-bandwidth users of the shortwave spectrum and thus are closely packed. Even they are finally due to switch to single sideband, essentially reducing their bandwidths by two-thirds, in the early 1990s.

Q. With so many non-volatile ROM chips available, why do manufacturers of expensive receivers still use volatile memory chips which require battery replacement which can lose programming? (Jeff Hooper, Blairsville, GA)

A. Money talks. Engineers first specify their requirements, then assess the marketplace for procurement. If a vendor says he has a chip that will do the job and it's non-volatile, great; if a cheaper volatile chip is available, you and I buy batteries!

Questions or suggestions sent to Bob Grove are printed in this column as space permits. If you prefer a reply by return mail, you must include a self-addressed, stamped envelope.

LETTERS

continued from page 3

Husted was offended by reader Luther Crumbaugh's comments on Glenn Hauser's sometimes "antagonistic" comments about Christian broadcasters, "HCJB and KGEI in particular."

Says Husted, "There is room in the 100+ pages of *Monitoring Times* for a variety of viewpoints, freely expressed. You must not allow this sort of complaint to intimidate you into muzzling Mr. Hauser."

New reader Bradley Beacham of Salt Lake City, Utah, agrees saying that although "I can't comment on Mr. Hauser's past record, I wouldn't mind reading his opinions (antagonistic or otherwise). They are only opinions, after all.

"Personally," Bradley continues, "I enjoy christian (sic) broadcasting primarily for their humor value. Family Radio's 'Unshackled' program, with its soap-opera-style testimonials (complete with melodramatic organ fills), is lots of fun. And the weirder, more cultish programs can be fascinating too. Creepy, but fascinating.

"If Mr Hauser directs me to the best and worst of these broadcasts, I'll be grateful to him. I'll be reading his column more closely in the future."

In a recent issue of *Insight* magazine following the appearance of an article on shortwave radio, Francis Barrett wrote that during World War II, Vatican Radio "was considered even more reliable than the BBC...because the Vatican had reason to be the most neutral."

This, says reader Bill Kiley, sparked off a debate. Rose Weber of Philadelphia then wrote to ask, "Is Mr. Barrett proud of the Vatican's neutrality? Does he admire the pope's failure to publicly condemn the Nazi murders? Neutrality in the face of the greatest evil ever to appear on this planet is not commendable.

"Mr. Barrett is also mistaken as to the fact of the neutrality. Perhaps he is also unaware that in August 1941, Archbishop Constantini invoked the blessing of God on the Italian and German soldiers. He must also be unaware that Vatican Radio under Pius XII routinely sought Third Reich approval (via Baron von Weizsaecker) of its broadcasts."

"I have been a subscriber to *Monitoring Times* for just a few short months," says Rev. William Peake of Buffalo Center, Iowa, "and I enjoy the publication immensely. Even though I am a shortwave listener, I even liked the recent article on 20 Ways to Increase Your Scanner Enjoyment.

"I have taken special note of the Below 500 kHz column recently because the Air Force has been holding informational meetings regarding a GWEN [Ground Wave Emergency Network] tower to be built about ten miles from here. The local newspaper nicknamed it the 'doomsday tower.'

"My question is, will I be able to make heads or tails out of the GWEN transmissions?" The answer is, probably not. From what we understand, most will be data bursts that, as Joe Woodlock stated, will probably sound like "heavy breathing or coughs."

The system is still in development, so anything is possible. Keep listening between 150 and 175 kHz.

Jeff Burdette of Greenville, South Carolina, commends *Monitoring Times* for promoting a professional attitude among scanner listeners. "The advice you give your readers is good. And I appreciate the fact that you advise listeners to enjoy their monitoring of police, fire and EMS traffic in their homes and not go 'chasing' calls." Jeff should know. He's a former police officer.

Jeff also monitors the military aero band. "Aircraft work out of military operating areas or MOAs. They all have names and the one located here in the Waynesville/Sylva area is called 'Snowbird.' I have heard some excellent 'dogfights' here on 239.9, 269.5, 298.7, 378.0 and 264.2,"

"I am really happy with the information, both technical and the fantastic frequency section in each issue of *Monitoring Times*," says Norma J. McGlaun of Columbus, Georgia. "I would like, however, to make a suggestion although I am not sure how difficult it might be to execute.

"My husband is totally blind and is a radio buff from 'way back. He enjoys your magazine, too, as I have read him several of your articles.

"What he would enjoy, and I'm sure other visually handicapped radio enthusiasts would love is their own issue of *Monitoring Times* in braille each month. I don't mind reading to my husband but he is very independent and enjoys doing things on his own."

That's an interesting idea. We'll look into it and let you know what we find out. In the meantime, can we get some feedback from other visually impaired subscribers?

"Here's my "highest compliment," says Robert A. "Rick" Barrow of Stroudsburg, Pennsylvania, who extends his subscription for three years. "I look forward to receiving *Monitoring Times* more than my ham magazines. I actually save *MT*. I don't even save *Playboy!* Keep up the good work.

"I started shortwave listening in 1972 at the age of 10," says Kevin Corey of Henrietta, New York. Eventually I earned my ham ticket. I now enjoy both hobbies immensely. Thanks for your no-nonsense, gutsy publication! *Monitoring Times* has sparked new interest for me in shortwave listening."

WARNING

The recent passage of the Electronic Communications Privacy Act of 1986 makes it ILLEGAL to intercept CELLULAR TELEPHONE conversations. Therefore do not program your BC 800XLT with frequencies between 824 and 849 MHz and 869 and 894 MHz.

Finally, we close on a frightening note. Buy a Bearcat 800XLT scanner and you'll find one of these legal-looking warnings inside warning you that it's against the law to "intercept" cellular telephone conversations. The real thing is 8-1/2 by 5-1/4 inches and done in the same bright red that is used on signs warning of impending electrocution or that you're trespassing on secret US military bases.

Two things pop to mind. Isn't this kind of crazy to be included with a scanner whose name -- Bearcat *800*XLT -- was designed to indicate that it could receive 800 megahertz frequencies?

And secondly, would you be frightened away from tuning in cellular car phones by this warning or would it have the opposite effect, tempting you to "see what this was all about"?

Perhaps someone wrote it with that in mind. After all, it even provides you with the *exact* frequencies *not* to program into the scanner.

It's a crazy world.

Letters should be addressed to ***Letters to the Editor,*** *Monitoring Times, P.O. Box 98, Brasstown, NC 28902 and should include the sender's address and telephone number. Not all letters can be used. Those that are will often be edited and excerpted. Because of the volume of mail received, personal replies are not always possible.*

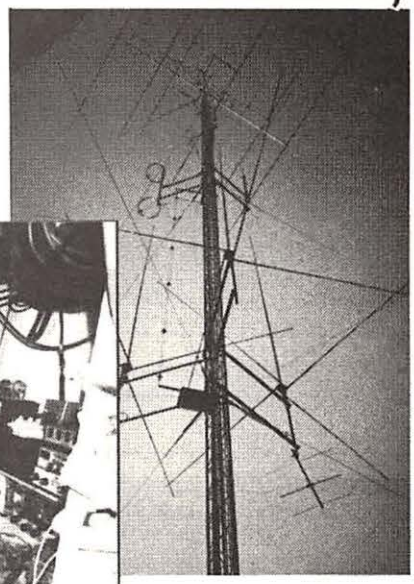
Monitoring Post Pin-ups

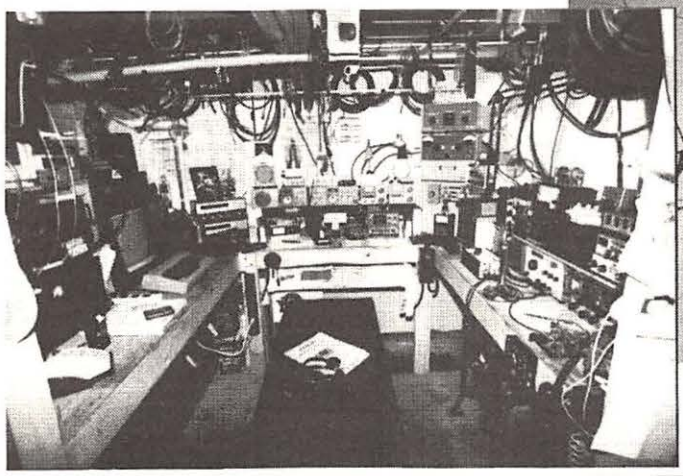
Since we seem to be featuring the ham bands this month, how about this station! KA1OXQ, Ken Nelson of Oakham, Massachusetts, calls it the biggest lightning rod in town connected to a bunch of spaghetti in the basement.

His main tower is 110 feet tall and the shack is loaded with goodies.

Ken works all bands, most modes, but code and AM operation are his favorites. Somewhere in there are also two scanners and four SW radios.

Let's hear it for RADIO FREE OAKHAM!





CONVENTION CALENDAR

Date	Location	Club/Contact Person
Sep 2-3	Shelby, NC	Shelby ARC/ Dale Mauney WA4BBN 1158 E. Marion St, Shelby, NC 28150 Talk-in 146.28/88
Sep 9	Windsor, ME	Augusta ARA/ Joseph Kozak WA2CJO 17 Carlisle Ave, Augusta, ME 04330
Sep 10	Harrisburg, IL	Shawnee ARC/ Mike Hoshiko W9CJW 707 S James, Carbondale, IL 62901
Sep 10	Butler, PA	Butler Co. ARA/ John Varljen K3HJH 174 Oak Hills Heights, Butler, PA 16001
Sep 10	Findlay, OH	Findlay ARC/ Pat Tendam KB8CXC 2534 Greenacre Dr, Findlay, OH 45840
Sep 10	Monett, MO	Ozarks ARS/ Charles M. Young WB0YIU Route 1 Box 29D, Republic, MO 65738
Sep 16	Wichita, TX	Wichita ARC/ Edward Fernandez WB5ONB 2415 Elmwood Cr. N, Wichita Falls, TX 76308
Sep 16-17	Peoria, IL	Peoria Area ARC/ John Coker P.O. Box 3461, Peoria, IL 61614 Talk-in 146.76; Gordon West guest speaker
Sep 16-17	Va Bch, VA	VA State Conv/ Art Thiemens AA4AT 2836 Greenwood Rd., Chesapeake, VA 23321
Sep 17	Mt Clemens, MI	L'Anse Creuse ARC/ Ralph Wilcox KA8YOJ 39610 Chart, Mt Clemens, MI 48045 Talk-in 147.08(+) and 146.52
Sep 17	Canfield, OH	20/9 ARC/ Don Carlson N8GJZ 7448 Glenwood Ave, Boardman, OH 44512
Sep 17-18	Cincinnati, OH	Gtr Cincinnati ARA/ John Haungs WA8STX 10615 Thornview Dr, Cincinnati, OH 45241
Sep 23-24	Grayslake, IL	Chicago FM Club/ Richard Hersh K9FFY 6614 N Francisco Ave, Chicago, IL 60645
Sep 23-24	Milton-Freewater, OR	Walla Walla Valley ARC/ Jack Babbitt WA5ZAY 1401 Pleasant, Walla Walla, WA 99362
Sep 24	Gainesville,GA	Lanierland ARC/ Eddie Keith KK4IG 3137 Lake Ranch Cir, Gainesville, GA 30506
Sep 24	Willimatic, CT	Natchaug ARA/ Ken Carvell KC1EW P.O. Box 19, Coventry, CT 06238
Sep 24	Berea, OH	Cleveland ARA/ Glenn Williams AF8C 513 Kenilworth Rd, Bay Village, OH 44140
Sep30-Oct1	Louisville,KY	KY Section Conv/ Mike Doerhoefer WB4AJZ P.O. Box 34232, Louisville, KY 40232
Sep30-Oct1	Wichita, KS	Kansas State Conv/ Gary Vreeland ND0T 1920 S. Santa Fe, Wichita, KS 67211
Oct 1	Benson, NC	Johnston Co ARS/ David Belcher 1205 Crescent, Smithfield, NC 27577
Oct 1	O'Fallen, MO	St. Peters ARC/ Walt Franzer KB0BCH 4 Eagle View Ct, St. Peters, MO 63376
Oct 1	W.Liberty, IA	Muscatine-IA City ARC/ Thomas Kramer KE0Y 905 Leroy St, Muscatine, IA 52761
Oct 1	Yonkers, NY	Yonkers ARC/ John Costa WB2AUL 195 Woodlands Ave, Yonkers, NY 10703
Oct 6-8	San Jose, CA	Pacific Div Conv/ Emmett Freitas, AE6Z 481 Fenley Ave, San Jose, CA 95117
Oct. 7	CO Springs, CO	Tucson Amateur Packet Radio Assoc 8th ARRL Computer Net Conf, CO Springs, CO
Oct 7	Huntington, WV	Tri State ARA/ Charlie Callicoat KB8CJB P.O. Box 4120, Huntington, WV 25729
Oct 7-8	Biloxi, MS	Miss State Conv/ Ed Byrd KA5VFU 18316 Landen Rd, Gulfport, MS 39503
Oct 8	Maysville, NC	Maysville, ARC/ Jo Ann Taylor WD4JUR 220 Anita Fort Dr, Swansboro, NC 28584
Oct 8	Lima, OH	NW Ohio ARC/ Jo-an Yoakam WB8VCO Rt 4, 5206 Norfolk St, Lima, Ohio 45806
Oct 8	Huntington, IN	Huntington Co ARS/ Mike Brooker WD9JFC 3341E - 722N, Huntington, IN 46750
Oct 14	Syracuse, NY	RA of Gtr Syracuse/ Vivian Douglas WA2PUU 213 Monticello Dr, S Syracuse, NY 13205 Talk-in 146.91 & 147.30 MHz
Oct 14-15	Memphis, TN	Mid-South ARA/ Wayne Gregory KB4GFK 3243 Tena Ruth Cove, Memphis, TN 38118
Oct 14-15	W Palm Bch, FL	Palm Beach RA/ Jame Schoech WD4LHF 129 Dayton Rd, Lake Worth, FL 33467
Oct 15	Queens, NY	Hall of Science ARC/ Stephen Greenbaum P.O. Box 131, Jamaica, NY 11415 Talk-in 144.300/223.6 & 445.225 rptr
Oct 15	W Friendshp,MD	Columbia ARA/ Art Goldman WA3CVG 5071 Beatrice Way, Columbia, MD 21044
Oct 15	Wall Twp., NJ	Jersey Shore ARC/ Paul Danielczyk N2HYG 579 Dutchess Ct, Toms River, NJ 08753
Oct 21	Smithfield, NC	Triangle East ARA/ Andrew Singer WK2F 10 Berkshire Place, Smithfield, NC 27577
Oct 21-22	WarnerRobins,GA	Central GA ARC/ Jese Kirkham WB4KQA 110 Brown Dr, Warner Robins, GA 31093
Oct 22	Bensalem, PA	Penn Wireless Assoc/ Howard Rubin N3FEZ 5890 Hudson Rd, Bensalem, PA 19020
Oct 28	Brooklyn Pk,MN	Twin City FM Club/ Mike Segelman K0BUD 35 Kentuck Ave So, Golden Valley, MN 55426
Oct 28-29	Chattanooga,TN	Chattanooga ARC/ Violet Cook N4EYJ P.O. Box 12, Wildwood, GA 37350

STOCK EXCHANGE

Ads for Stock Exchange must be received 45 days prior to the publication date.

NON-COMMERCIAL SUBSCRIBER RATES: $.25 per word - *Subscribers only.* All ads must be paid in advance to *Monitoring Times*. All merchandise must be personal and radio-related.

COMMERCIAL RATES: $1.00 per word payable with ad

1-3/4" SQUARE DISPLAY AD: $35 per issue, payable in advance.

Monitoring Times assumes no responsibility for misrepresented merchandise.

New Technology/Products Reduce Utility Bills! Home Energy Improvements 800-347-9231

REGENCY HX-1000 Portable Scanner: box, manual, recharger, reg. case & Regency heavy duty case, 30 chan - $140. [212] 534-5045 9-11:30 p.m. EST. C. Wolgel, 201 East 86th St, New York, NY 10028.

When readers are in the market, they look here to find your ad ... Will it be here?

KENWOOD R2-1 Scanner Receiver. Mint condition. Never mounted mobile. $350. Bill [205] 541-2957.

ICOM R-71A brand new in box, manual - $615. PANASONIC RF B600 Shortwave, new - $399. NIPPON FS1196 PLL Shortwave - $59. CITIZEN World Time in GMT & local - $15. Call [612] 560-4178.

For Sale: KENWOOD R5000 receiver 2 years old, mint condition with optional 6, 1.8 kHz filters and VHF converter. Original packing and manuals. $565 PPD. David S. Kendall N9HYQ, 1610 Fruit St., Huntington, IN 46750 [219] 356-5096 after 6 EST.

JAPAN RADIO NRD-525, like new - $950. New remote control for ICOM R-7000 - $50. J. Ward, 3900 McCain Pk. Dr., B8, Apt 149, N. Little Rock, AR 72116. Phone [501] 771-1779.

SANGEAN ATS 803, one year old, excellent condition - $105. Bob Berg, 3539 Warringham, Waterford, Michigan 48095 [313] 623-6636.

For Sale: PRO 2004 with cellular mod, like new, in box with instructions - $300. Bob, P.O. Box 1181, Bellmore, NY 11710 [516] 781-5061.

THOMPSON 4120 color monitor w/IBM CGA color card, excellent condition - $200. HX1200, like new - $130. Both w/accessories, boxes. Christner, 306 Woodview, Cortland, Ohio 44410.

For Sale: SONY ICF 2010, seldom used - $275. Harald Herp, 6615 Michele Ct, Huntington, MD 20639 [301] 855-7071.

ESTATE SALE: UNIDEN BC-760XLT 100 channel w/800 MHz, mint - $189. REGENCY INF-2 Turbo Scan, new - $89. RADIO SHACK 4 Channel hand-held - $415. AOR AR-2002 scanner, mint - first $295. All Accessories. Keith [407] 260-2937.

Approximately 30 issues each (1986-present) of MONITORING TIMES and POPULAR COMMUNICATIONS. $20 + UPS. Bill Frantz, 412 Briarwood Dr, Thomasville, GA 31792 [912] 226-1203.

For Sale: Ham Radio, TEMPO 2020, Excellent condition, has 11 meters and new D104 microphone - $400 plus shipping. Also brand new COBRA 2000 completely modified with roger beep - $425 plus shipping. Gary [207] 778-2646.

For Sale: All in PINK condition. JRC-525 plus speaker - $850. ICOM R71A plus RC-11 Remote - $700. SONY AIR-8 - $170. Prices plus UPS. Jose Fernandez, Box 3047, Bayamon, P.R. 00621.

ICOM R-71A (PBT) - $715. ICOM R-7000 - $865. ICOM AT-550 9-band Auto ant tuner - $250. ALINCO ALX-2T 2MTR HT with accessories - $200. PANASONIC RF-B60 SW receiver - $200. Jerry [513] 779-4409.

WANTED: PRO 2004 scanners in good condition or REGENCY MX 7000's. Interested in contacting fire departments in California, Nevada, and Arizona as well as forestry listeners. Please contact Robb at [800] 228-3550.

INFOTECH M-600 Multi-Mode Code receiver CW/RTTY/TOR/ASCII with ZENITH Monitor Screen, like new - $300. REGENCY Digital Scan 16 Ch. Aircraft Only Scanner - $50. [718] 836-4982.

Deluxe ITT eight-station office TELEPHONE/INTERCOM system, up to 6 incoming lines, late model, excellent condition. Cost $3000, sell only $950 including complete manual.

PORTABLE TV, 4-1/2" monochrome CRT, excellent; works off AC, 12 VDC mobile (cigarette lighter adapter included), batteries (battery compartment included). $39 includes shipping.

BLACK JAGUAR BJ200 Mark III hand-held scanner, covers military UHF aero band. New with all accessories. $250 includes shipping.

Grove Enterprises, P.O. Box 98, Brasstown, NC 28902 [704] 837-9200. No credit card charges on these items.

Utility bills keeping you from enjoying SWLing? Go solar with a 12 or 24VDC system, or convert it to AC and power your whole home. $5.00 brings 62 pg color catalog of solar energy systems and products. Solar Futures PO Box 328 Placerville, CA 95667

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3.5" 1.44 MB high quality disks
10 for $15 - Free shipping

Call for special

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HANDHELD SCANNER HEADQUARTERS

For CASES and ANTENNAS. We carry ANTENNAS for all SCANNERS and can match all CONNECTORS 24 HOUR SHIPPING. All FREQS in stock. THIS MONTHS SPECIALS: ORIGINAL EQUIPMENT REPLACEMENT ALL BAND ANTENNA $7.75/ HIGH EFFICIENCY GAIN ANTENNA $14.95. We also make ANTENNAS for your most used frequency, short or long $9.95. We can make any band ANTENNA HI/LO/UHF/800 and AIRCRAFT. This months SPECIAL SPECIAL TELESCOPING WHIP with SPRING $10.50 WITHOUT SPRING $8.00. SPECIAL SPECIAL SPECIAL GAIN TELESCOPING WHIP 155 MHZ $19.95. CASE SPECIAL THIS MONTH RADIO SHACK SCANNER CASE MODEL PRO 30,31,32 LEATHER CASE $37.50, REGENCY MODEL HX-1000,HX-1200,HX-1500 $37.50. Swivel mounts available. We also sell cases for commercial and ham hand helds. CALL OR WRITE TO ORDER, ADD $1.00 FOR SHIPPING ON ALL CASES AND ANT. SPECIFY FREQ AND CONNECTOR ON ALL ANT. SEND $1.00 FOR CATALOG, REDEEMED WITH ORDER TO: KOLIER COMMUNICATIONS, P.O.Box 5343MT, ROCKY PT, NY 11778 OR CALL 1-516-821-5048 8 TO 8 EST MON-SAT.

AMIGA - COMMODORE Chips...Parts...Upgrades

6526	$12.95	8362(DENISE)	56.95
6567	16.95	8370(F.AGNUS)	61.50
6510	10.95	8386(GARY/5719)	17.25
6581	11.95	8520A1	17.25
PLA (82S100)	12.95	A501 RAM module	147.00
901 ROMS	11.95	1.3 Kickstart ROM	27.95
8364(PAULA)	$56.95	Many others in stock	

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COMMODORE DIAGNOSTICIAN II

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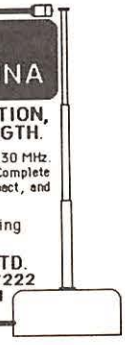

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Closing Comments

Florida's "Scanner Ban"

-- Much Ado About Nothing?

"What do you think about Florida's new scanner law?" the caller asked. "What new scanner law?" I replied. The caller went on to explain that Attorney General Bob Butterworth had just issued an opinion that allowed radio and TV stations to monitor police calls, but not newspapers or the general public.

I was incredulous. "Could you FAX me a copy?" I asked. Minutes later, the office FAX machine buzzed with the newswire copy in question.

"Florida's attorney general says it's OK for radio and television stations to have police scanners -- but it's not OK for newspapers," the copy said. "Butterworth says the prohibition extends almost across the board to include hobbyists -- motorists and even newspapers," it continued. I was stunned. *MT* was going to have a look at this situation!

A few phone calls brought a copy of the original seven-page opinion from the attorney general's office, the original question which prompted it and, most important of all, a considered interpretation of the entire matter by *MT* reader and lawyer Frank Terranella.

Apparently, the debacle started when Peter A. Petracco, chief of the Boca Raton Police Department, asked Attorney General Butterworth, "Does the installation and operation of police band radio monitors by persons other than radio or television stations violate the provisions of s. 843.16, F.S. (Florida's scanner statute)"?

Terranella, an activist for recreational monitors' rights, feels that, in spite of the news report, Butterworth was simply trying to make "the best of a bad law." In spite of the newswire's claims, neither present Florida statute nor the attorney general's statement prohibits scanning at home.

Prohibitions are against scanners beings installed in motor vehicles, business establishments and newspaper offices. Exempted are licensed hams, radio and TV stations, and emergency personnel. A battery-powered (hand-held) scanner is apparently not prohibited in any case!

Of the 50 United States, 35 have no listening restrictions whatsoever and of the remaining 15, only Kentucky and New Jersey prohibit all private citizens, including hams, from monitoring police calls from their cars. No states prohibit monitoring at home.

Restrictive monitoring laws have been around since the 1930's; they have been challenged repeatedly by court cases and upheld consistently. The Supreme Court, however, has never been called on to make a decision at the federal level.

Terranella cites a number of cases where the courts uphold the right to listen as one aspect of the First Amendment to the United States Constitution which guarantees the right to receive information and ideas. The Electronic Communications Privacy Act (ECPA) of 1986 defines those communications which may be monitored, and these include unscrambled police transmissions.

When the self-serving interests of the Cellular Telecommunications Industry Association (CTIA) contrived the ECPA in an effort to legitimize the fallacious claim that cellular telephones were private, they may have inadvertently done the radio hobby a favor. When the Act is finally challenged in court, wide-sweeping clarifications should remove the stigma of hobby monitoring once and for all.

Monitoring Times is grateful to Terranella for his vigilance, thoroughness and dedication to the cause of recreational monitoring.

-- Bob Grove, WA4PYQ
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R-2000

The R-2000 is an all band, all mode receiver with 10 memory channels and many deluxe features such as programmable scanning, dual 24-hour clocks with timer, all-mode squelch and noise blankers, a large, front-mounted speaker, 110 volt AC or 12 volt DC operation (with the DCK-1 cable kit), and 118-174 MHz VHF capability with VC-10 option.

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Optional Accessory
- **PG-2N** Extra DC cable

Optional Accessories

R-2000:
- **VC-10** VHF converter
- **DCK-1** DC cable kit for 12 volt DC use.

R-5000:
- **VC-20** VHF converter
- **VS-1** Voice module
- **DCK-2** for 12 volt DC operation
- **YK-88A-1** AM filter
- **YK-88SN** SSB filter
- **YK-88C** CW filter
- **MB-430** Mounting bracket.

Other Accessories:
- **SP-430** External speaker
- **SP-41** Compact mobile speaker
- **SP-50B** Mobile speaker
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